FIG. 1

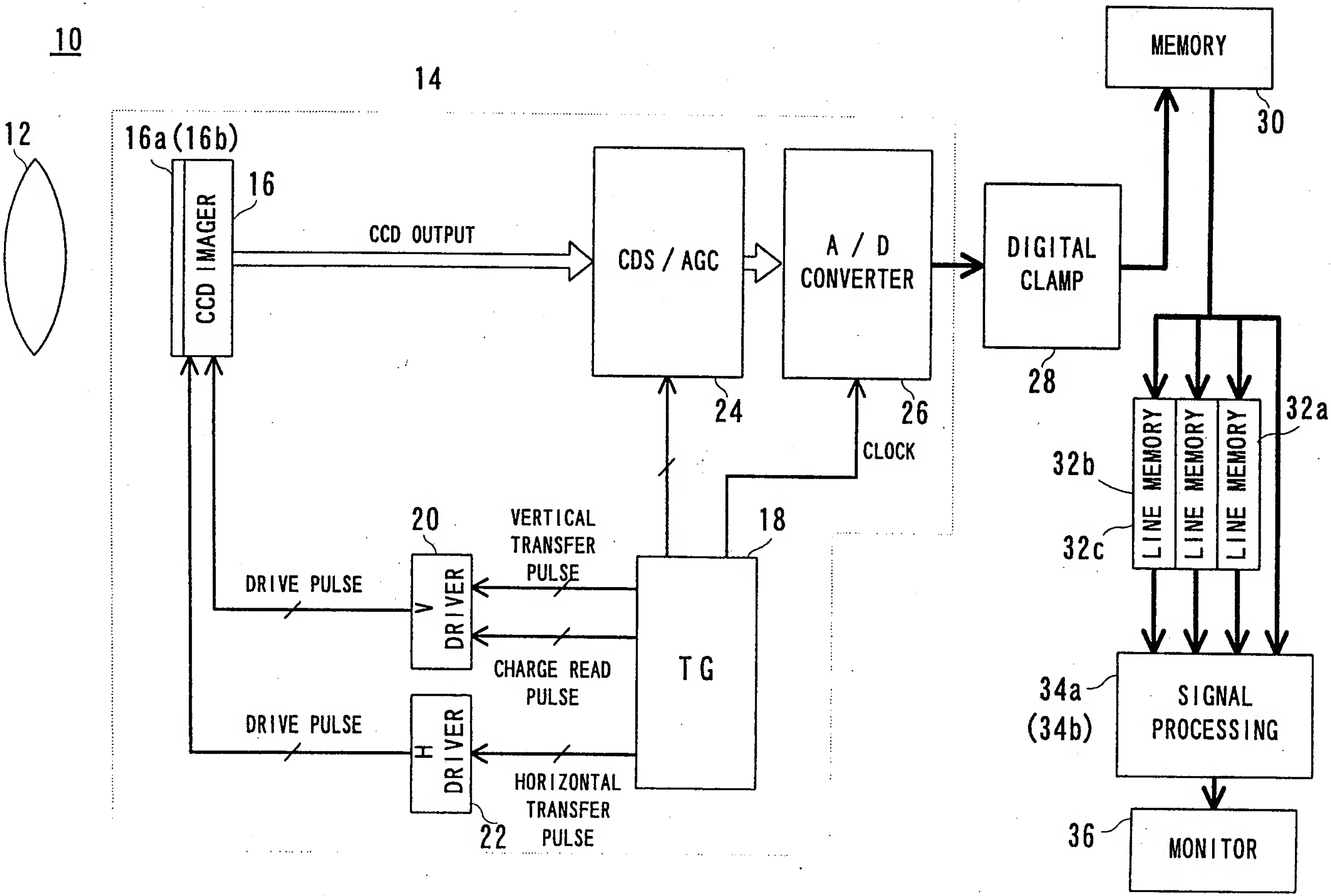

10
14
12
16a(16b)
16
CCD IMAGER
CCD OUTPUT
CDS / AGC
A / D CONVERTER
DIGITAL CLAMP
MEMORY
30
28
24
26
CLOCK
32a
32b
32c
LINE MEMORY
LINE MEMORY
LINE MEMORY
20
VERTICAL TRANSFER PULSE
18
DRIVE PULSE
V DRIVER
CHARGE READ PULSE
TG
DRIVE PULSE
H DRIVER
HORIZONTAL TRANSFER PULSE
22
34a
(34b)
SIGNAL PROCESSING
36
MONITOR

FIG. 2

16a

Ye	Cy	Ye	Cy	Ye	
G	Mg	G	Mg	G	
Ye	Cy	Ye	Cy	Ye	
G	Mg	G	Mg	G	
Ye	Cy	Ye	Cy	Ye	
G	Mg	G	Mg	G	
Ye	Cy	Ye	Cy	Ye	
G	Mg	G	Mg	G	

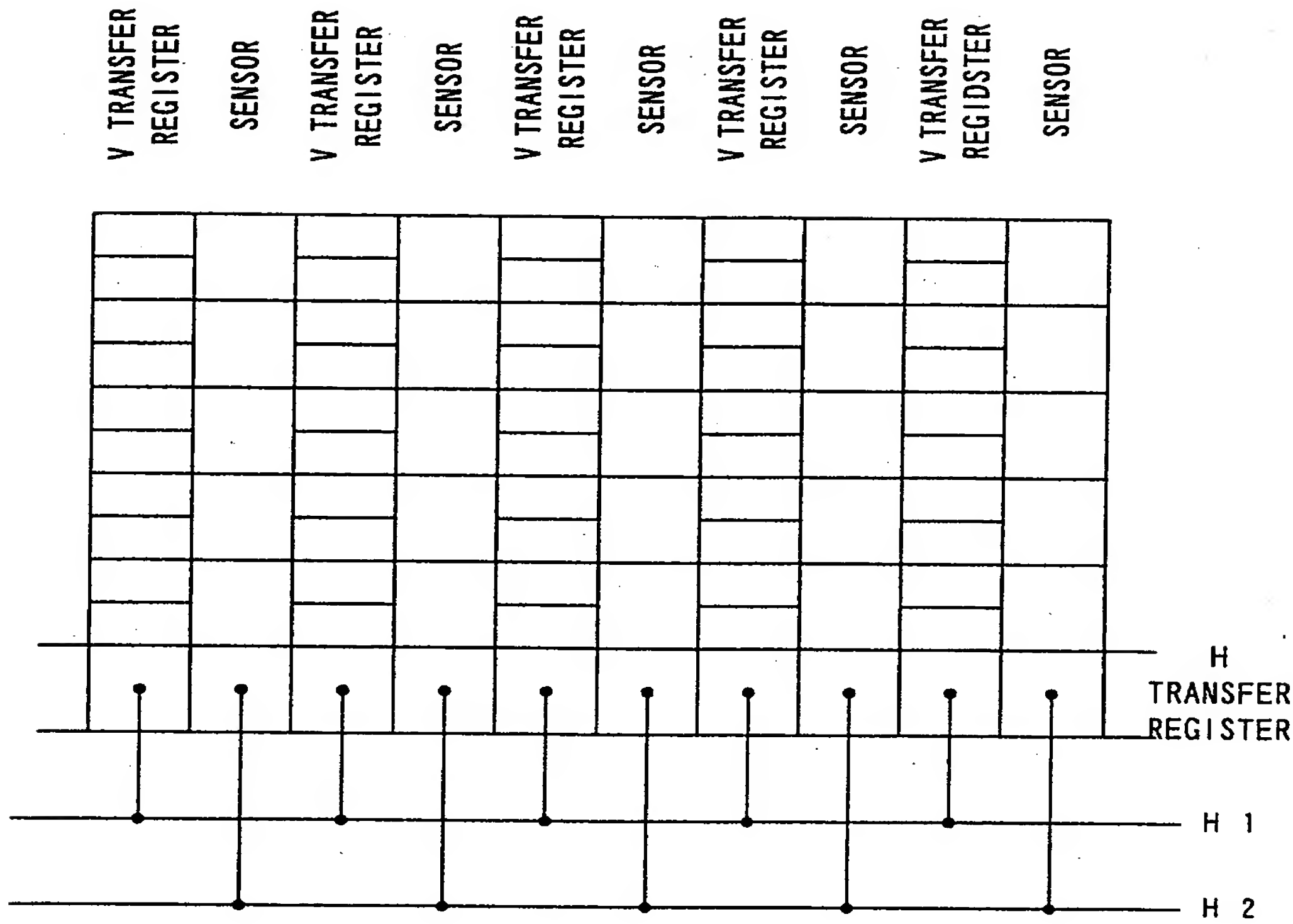
FIG. 3

16b

Ye	Cy	Ye	Cy	Ye	
Mg	G	Mg	G	Mg	
Ye	Cy	Ye	Cy	Ye	
G	Mg	G	Mg	G	
Ye	Cy	Ye	Cy	Ye	
Mg	G	Mg	G	Mg	
Ye	Cy	Ye	Cy	Ye	
G	Mg	G	Mg	G	

FIG. 4

(A)


V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGIDSTER
SENSOR
H TRANSFER REGISTER
H 1
H 2

(B)

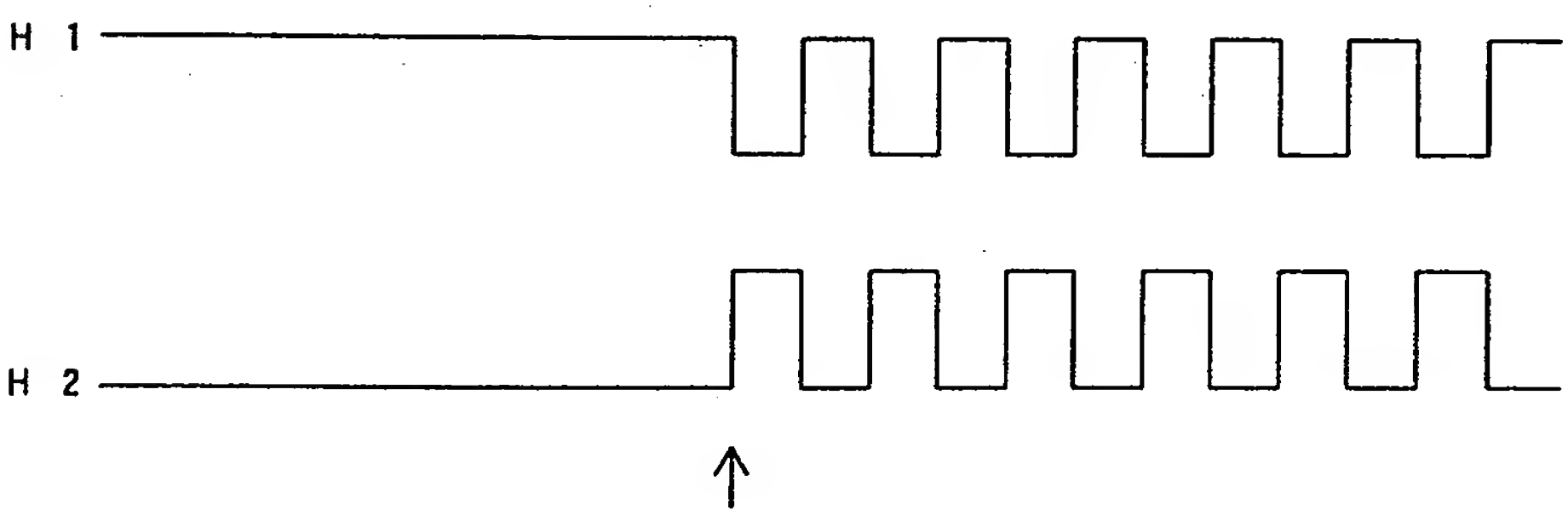

H 1
H 2
1-BLOCK VERTICAL TRANSFER COMPLETED

FIG. 5

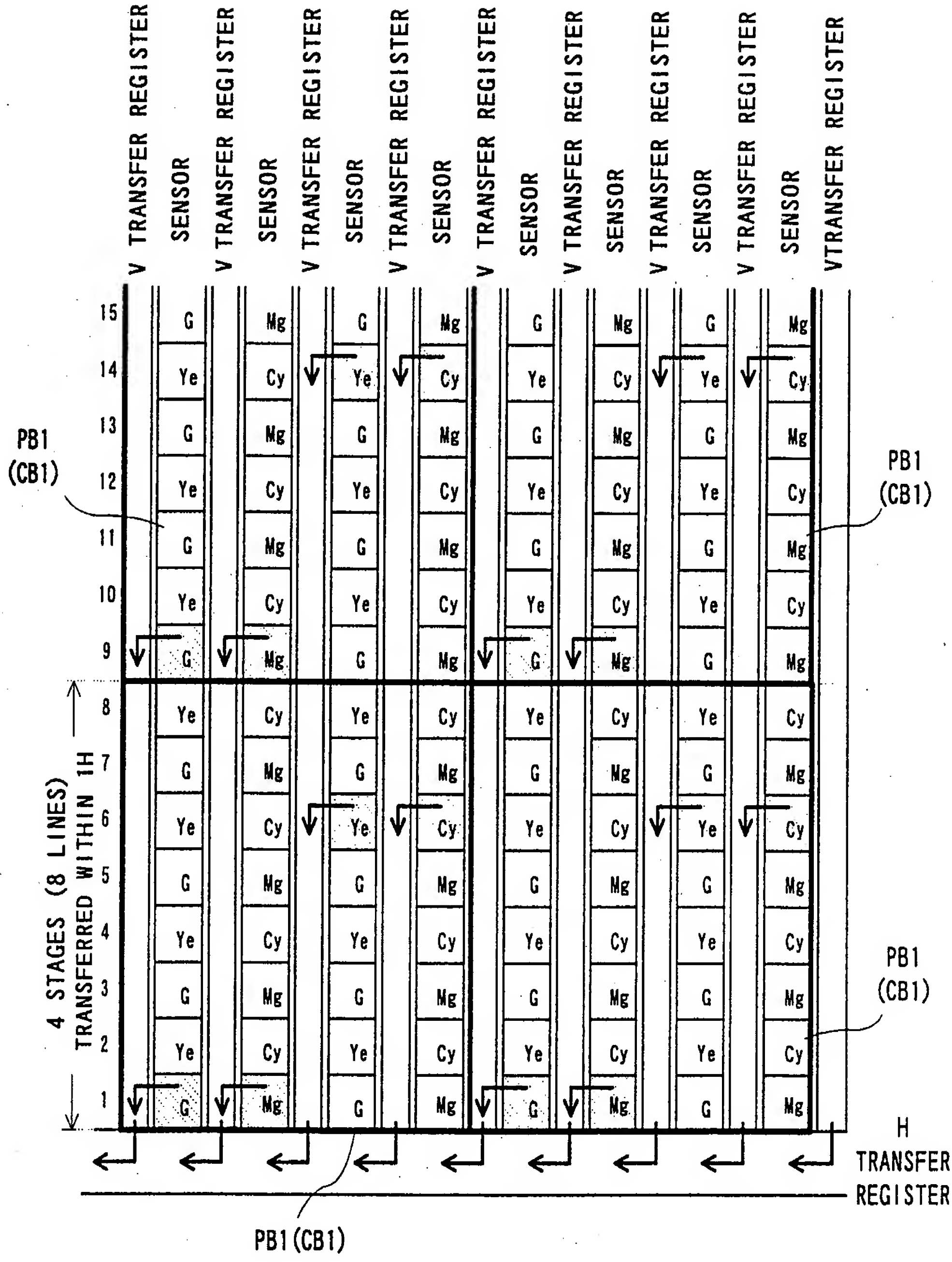

V TRANSFER REGISTER
SENSOR
G
Mg
Ye
Cy
PB1
(CB1)
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
4 STAGES (8 LINES)
TRANSFERRED WITHIN 1H
H
TRANSFER
REGISTER

FIG. 6

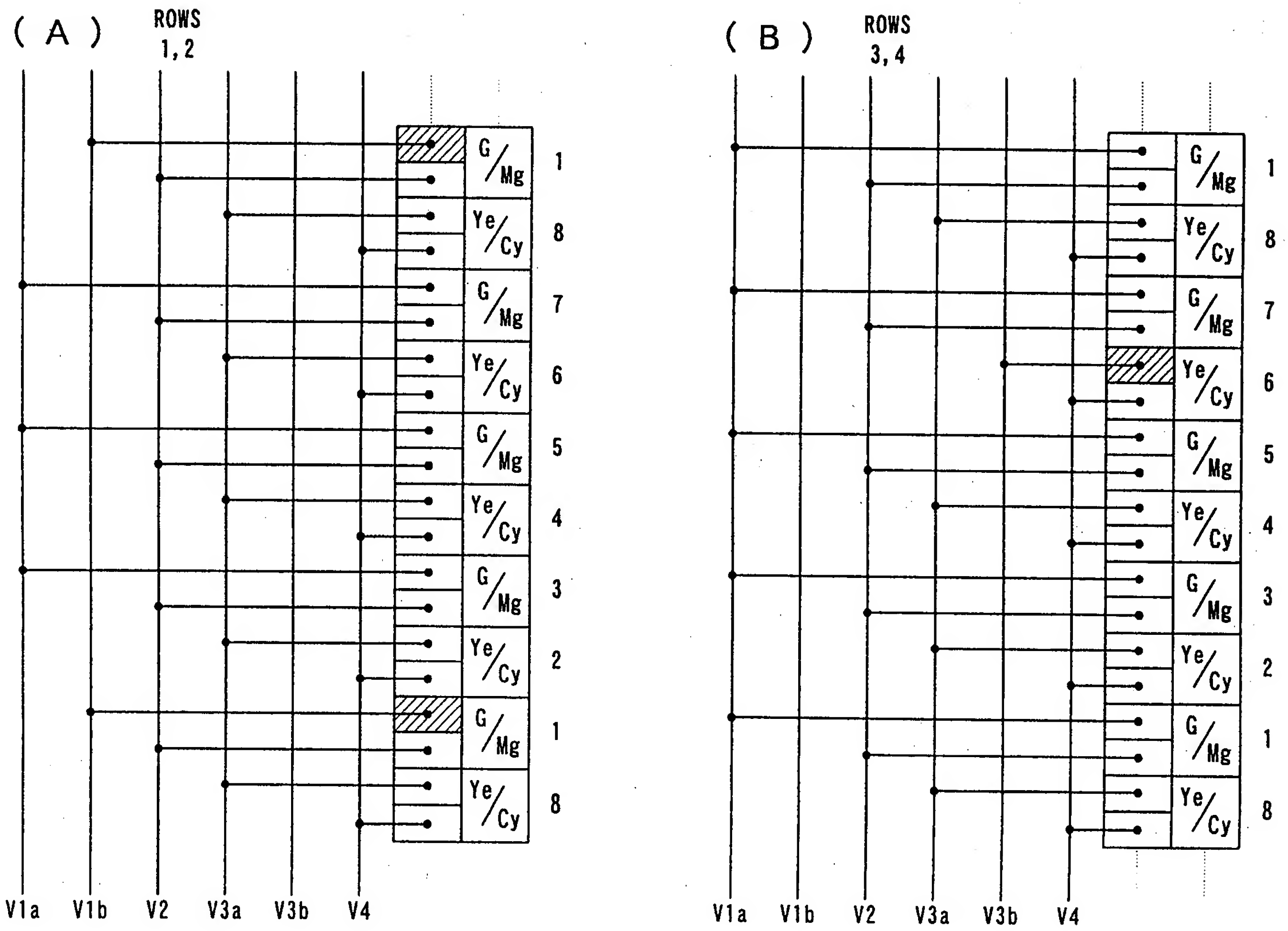
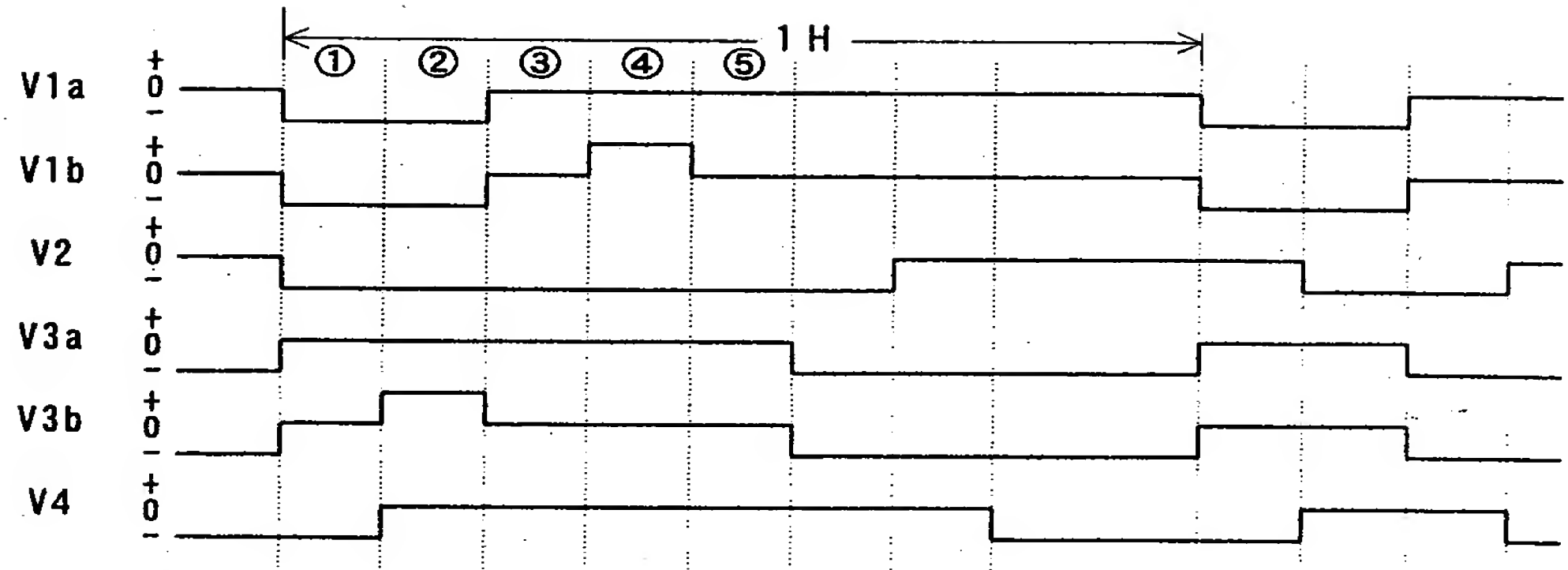
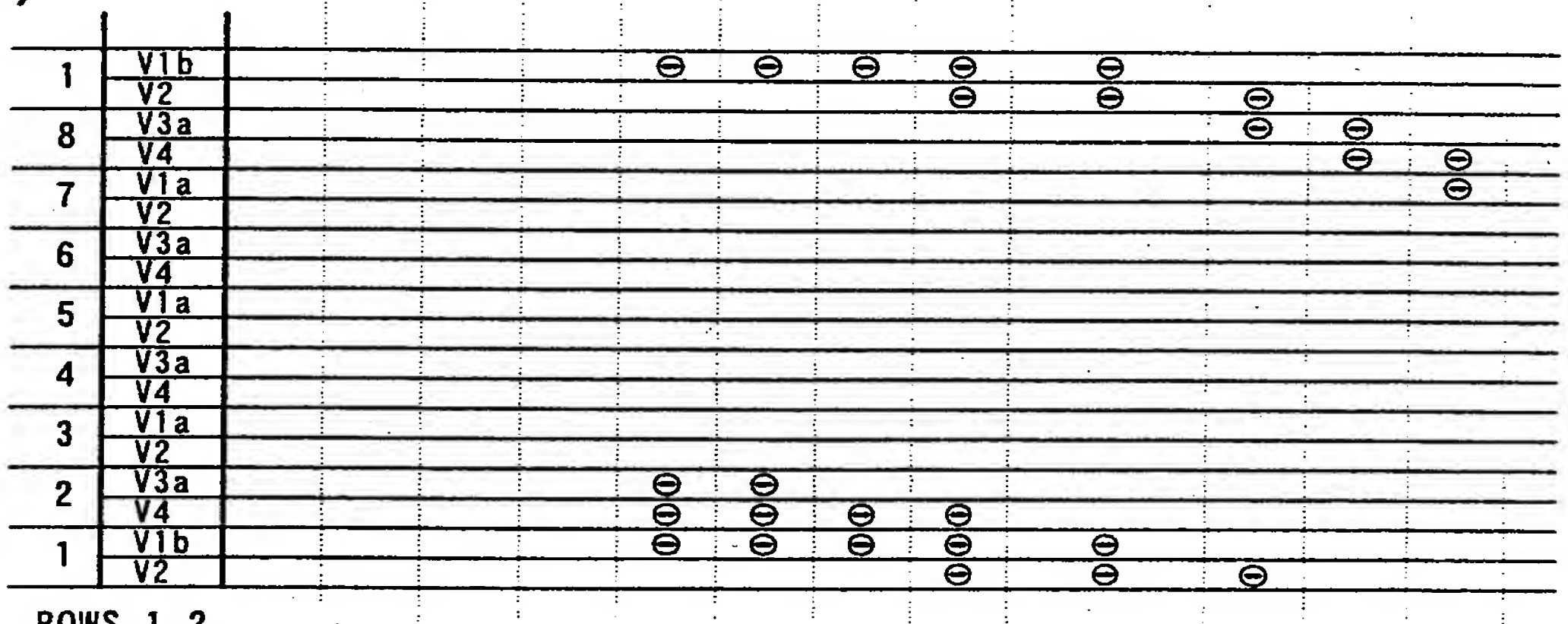

(A)
ROWS
1, 2
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
8
7
6
5
4
3
2
1
8
V1a
V1b
V2
V3a
V3b
V4
(B)
ROWS
3, 4
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
8
7
6
5
4
3
2
1
8
V1a
V1b
V2
V3a
V3b
V4

FIG. 7

(A)

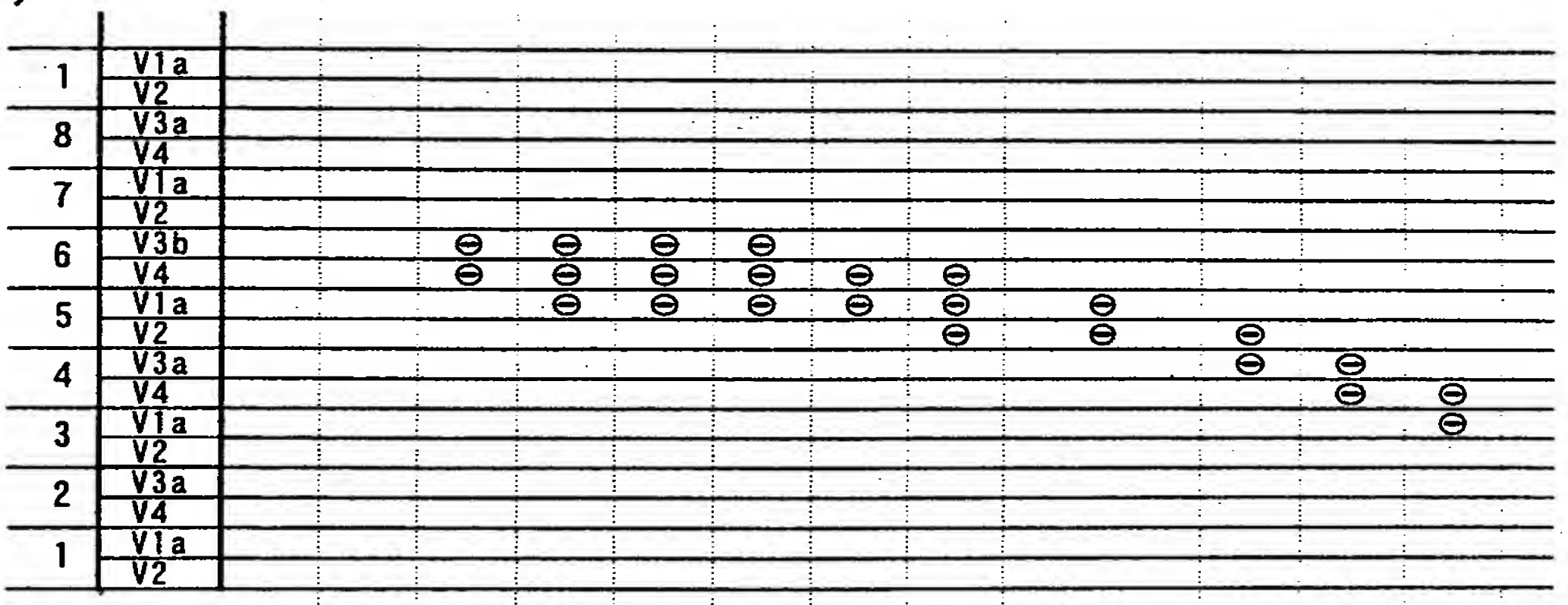


(B)



ROWS 1, 2

(C)



ROWS 3, 4

FIG. 8

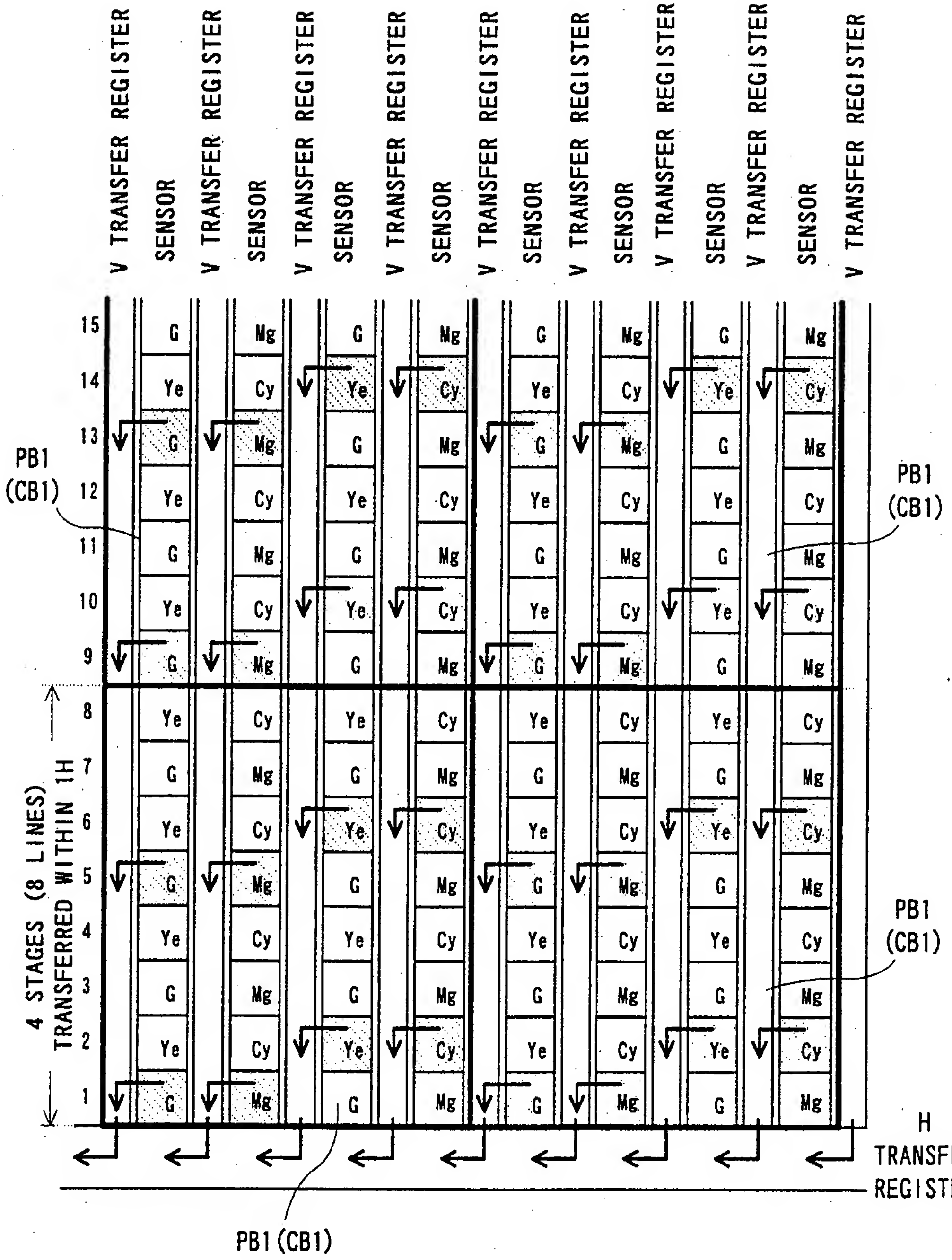

V TRANSFER REGISTER
SENSOR
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
G
Mg
Ye
Cy
PB1
(CB1)
4 STAGES (8 LINES) TRANSFERRED WITHIN 1H
H TRANSFER REGISTER
PB1 (CB1)

FIG. 9

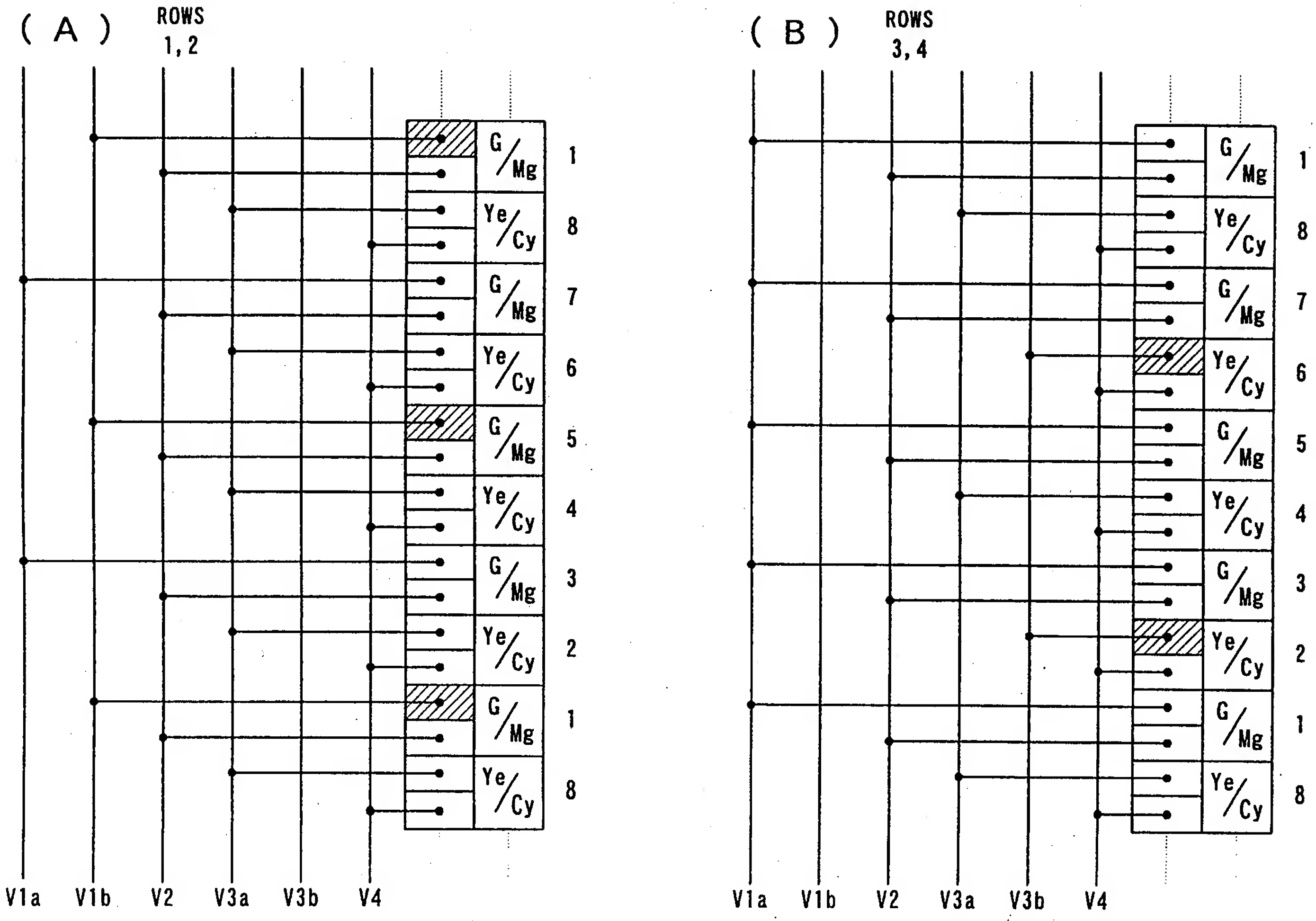
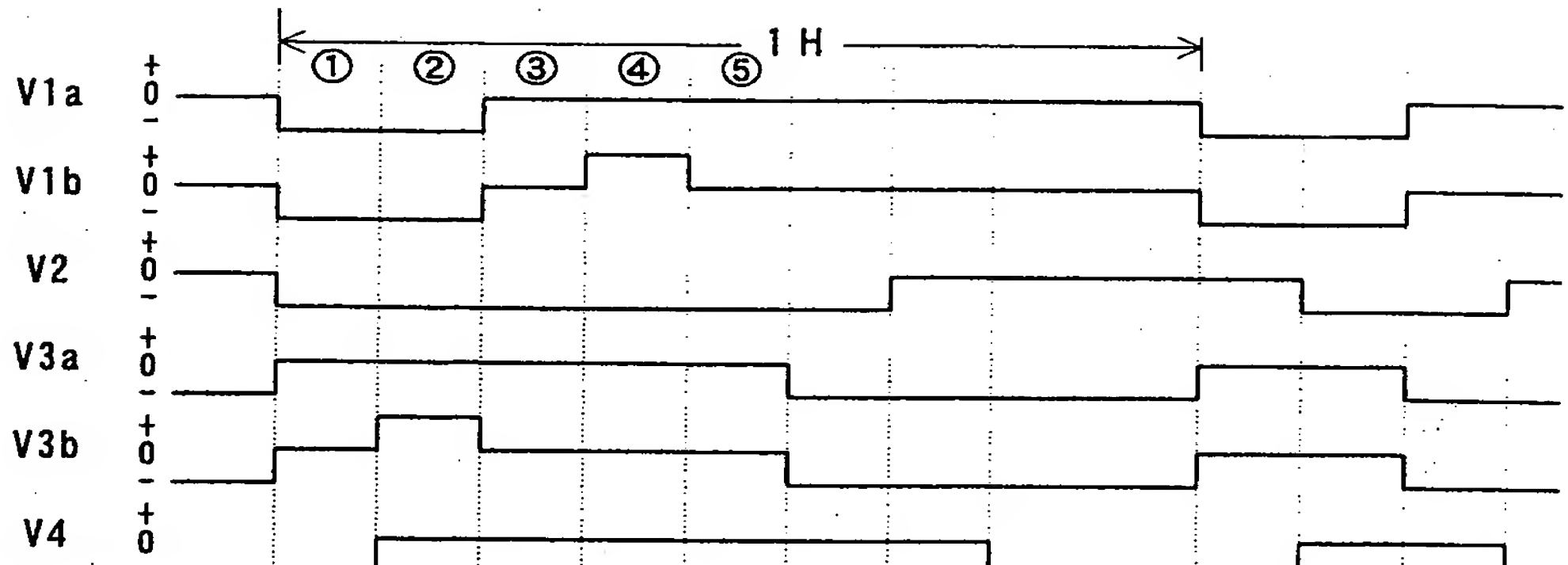
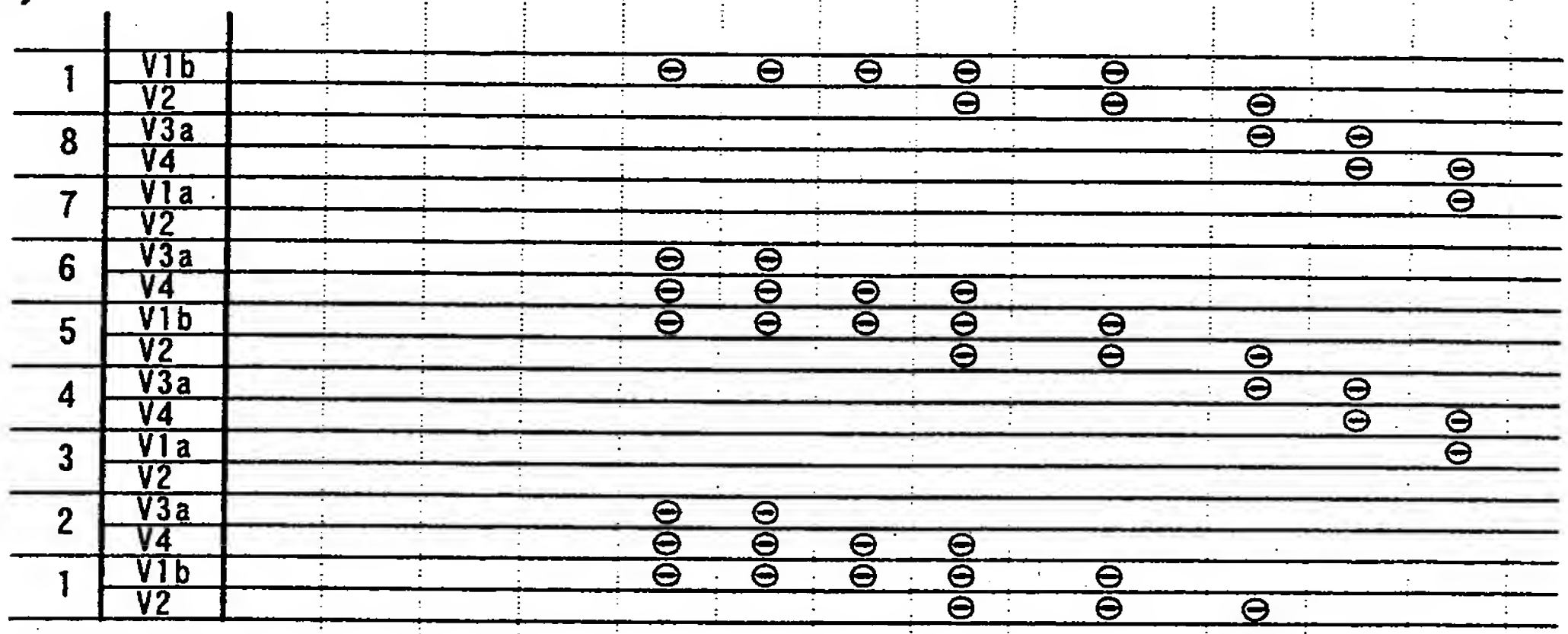

(A)
ROWS
1, 2
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
8
7
6
5
4
3
2
1
8
V1a
V1b
V2
V3a
V3b
V4
(B)
ROWS
3, 4
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
8
7
6
5
4
3
2
1
8
V1a
V1b
V2
V3a
V3b
V4

FIG. 10

(A)

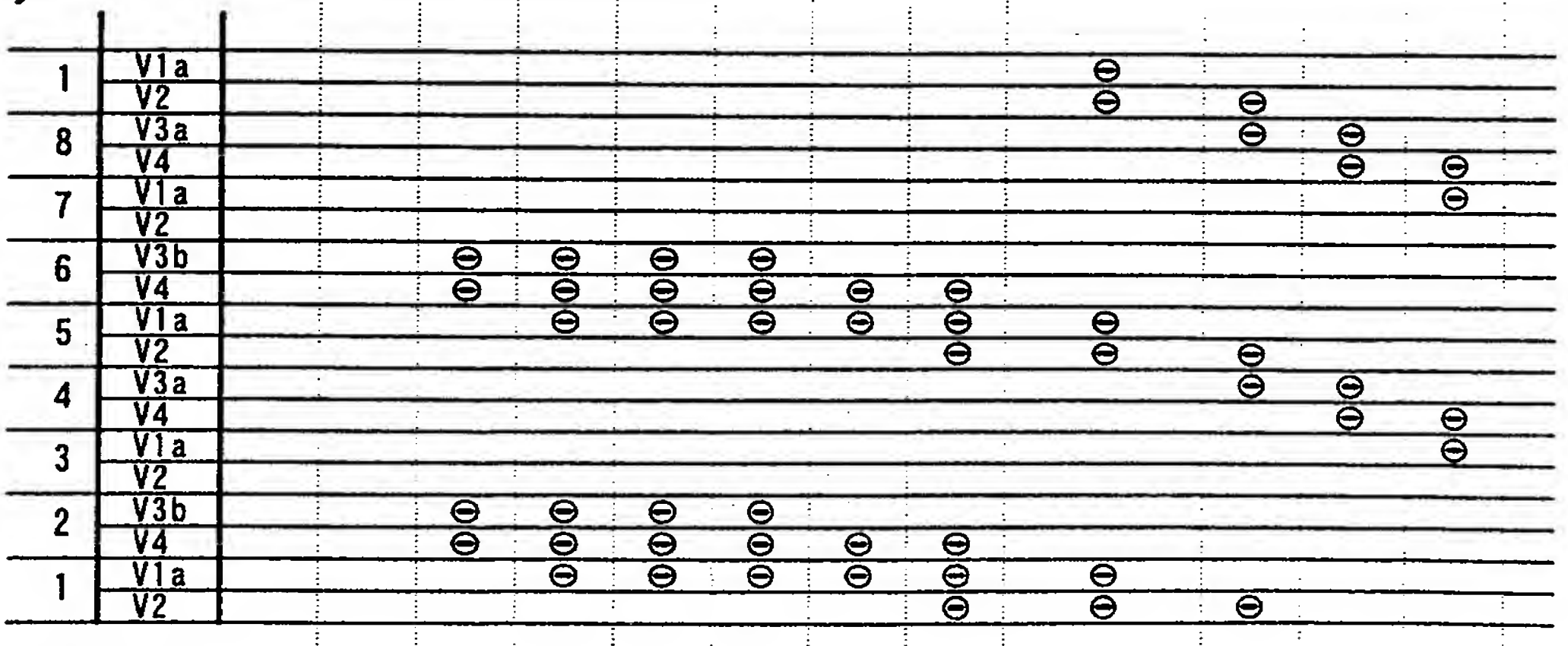


(B)



ROWS 1, 2

(C)



ROWS 3, 4

FIG. 11

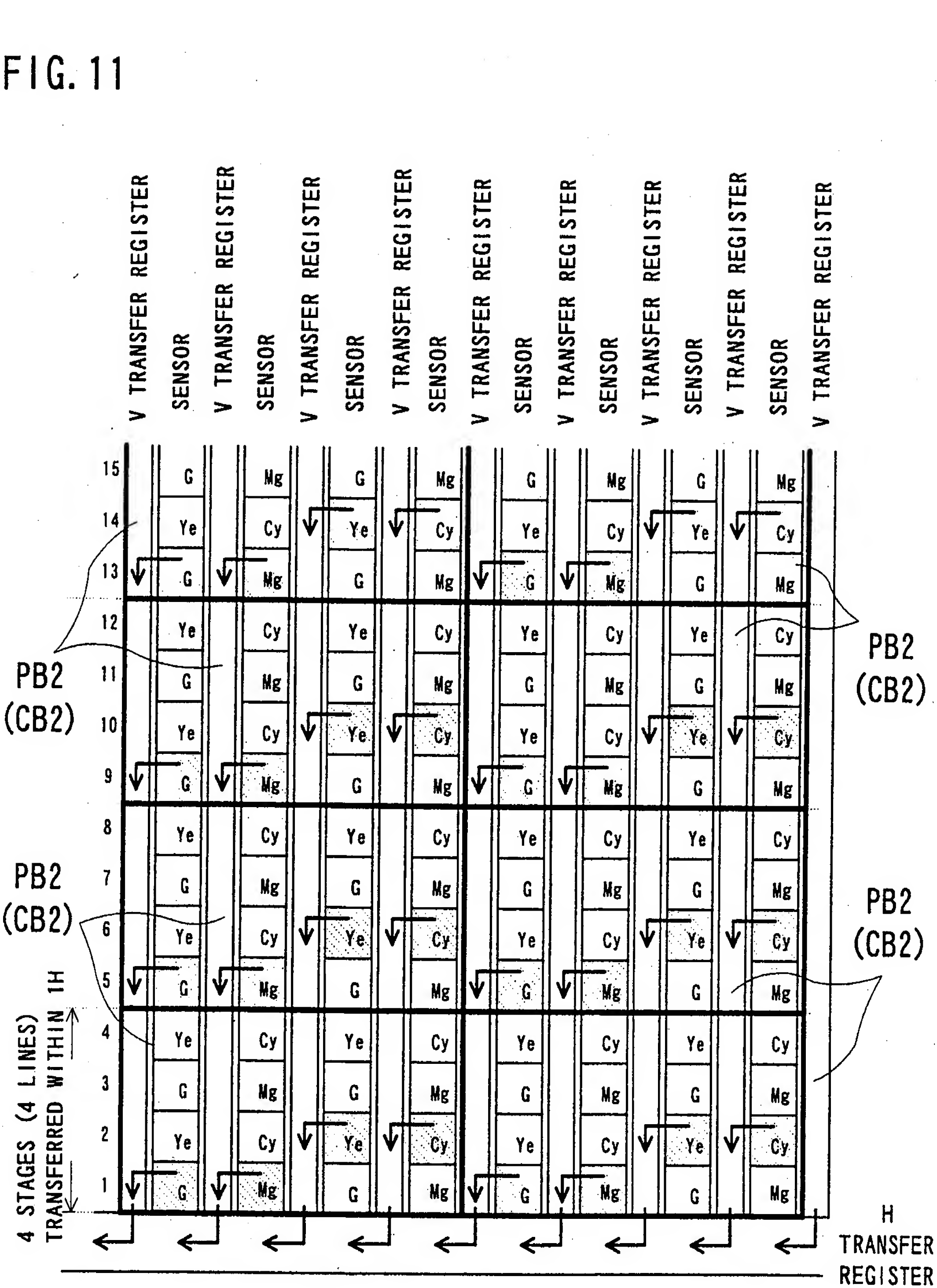

V TRANSFER REGISTER
SENSOR
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
G
Mg
Ye
Cy
PB2
(CB2)
4 STAGES (4 LINES)
TRANSFERRED WITHIN 1H
H
TRANSFER
REGISTER

FIG. 12

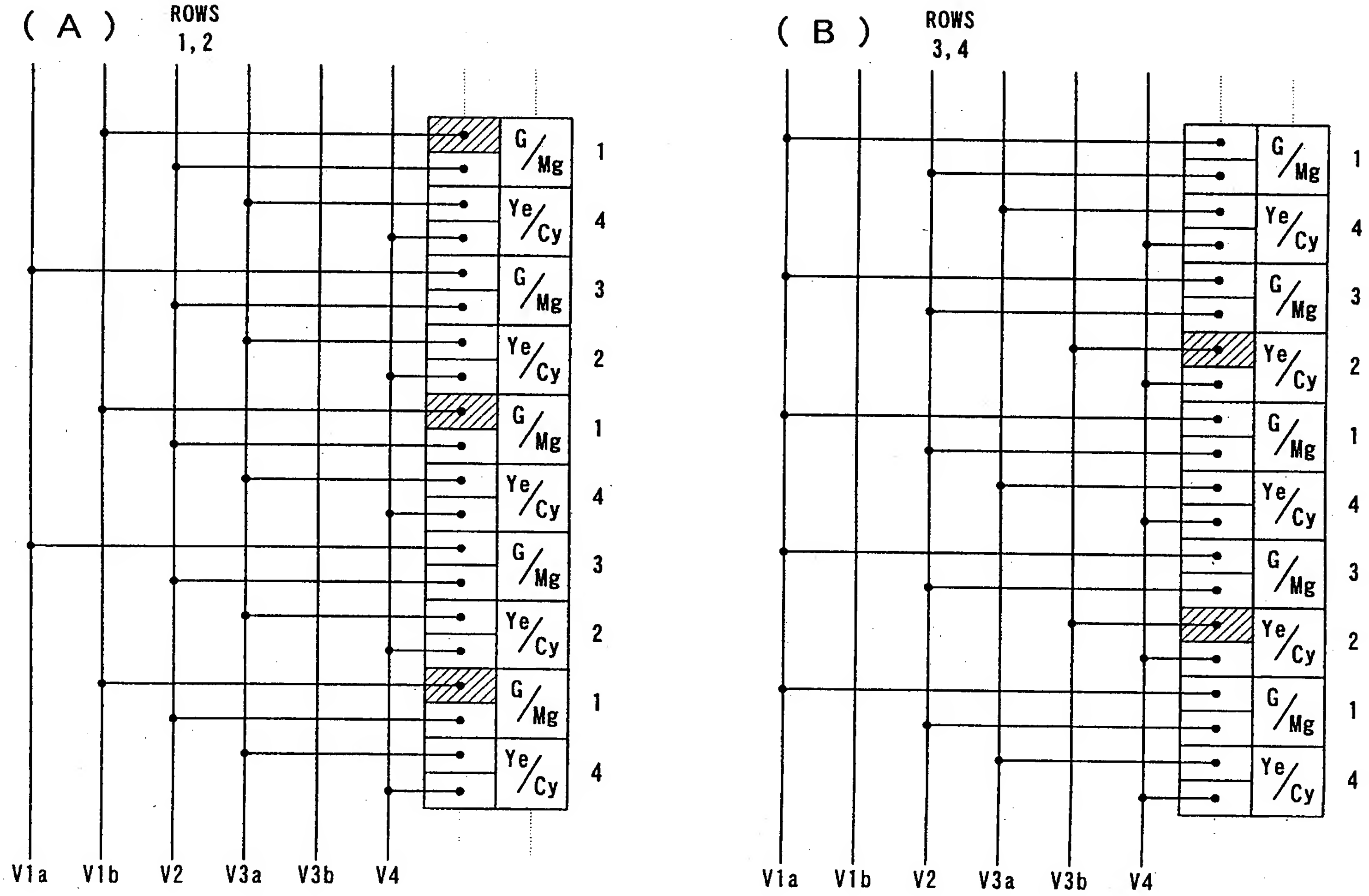
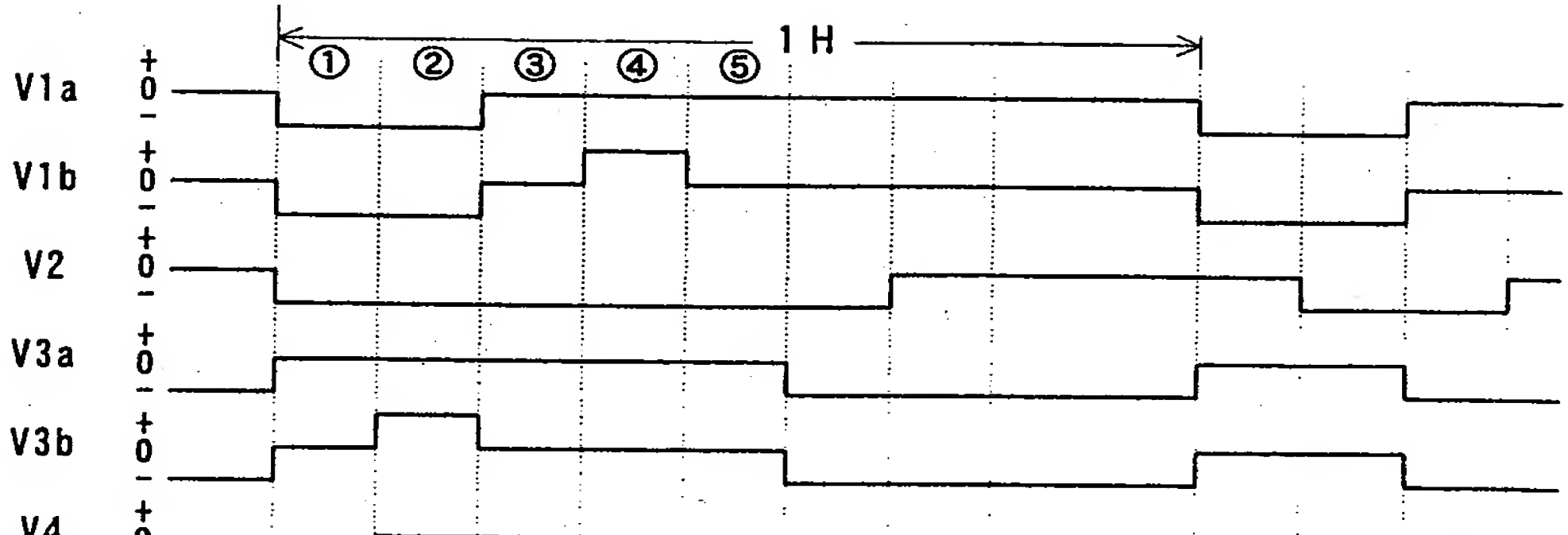
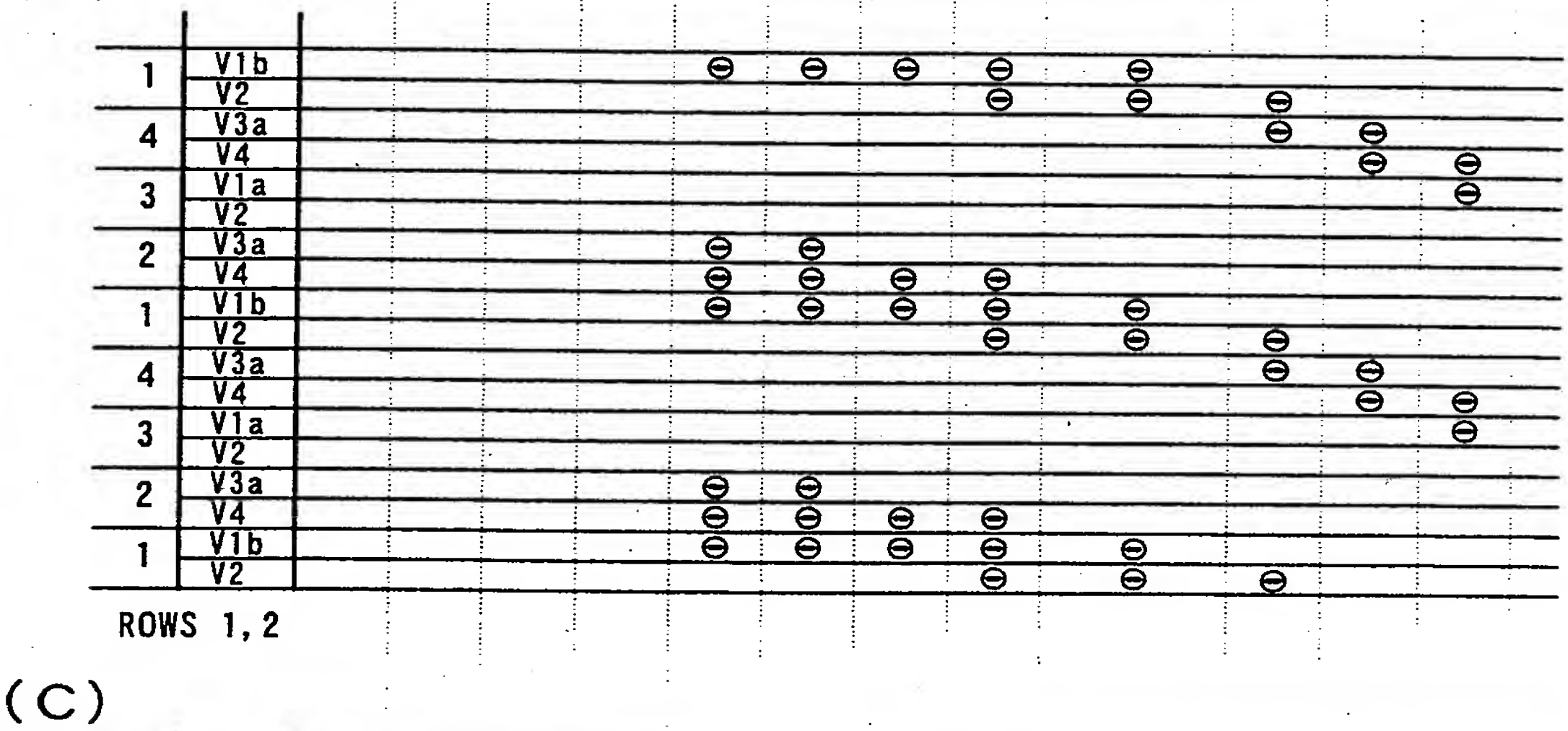

(A)
ROWS
1, 2
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
4
3
2
1
4
V1a
V1b
V2
V3a
V3b
V4
(B)
ROWS
3, 4
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
4
3
2
1
4
V1a
V1b
V2
V3a
V3b
V4

FIG. 13

(A)


1 H
①
②
③
④
⑤
V1a
V1b
V2
V3a
V3b
V4
+
0
−

(B)


1 V1b
V2
4 V3a
V4
3 V1a
V2
2 V3a
V4
1 V1b
V2
4 V3a
V4
3 V1a
V2
2 V3a
V4
1 V1b
V2
ROWS 1, 2

(C)

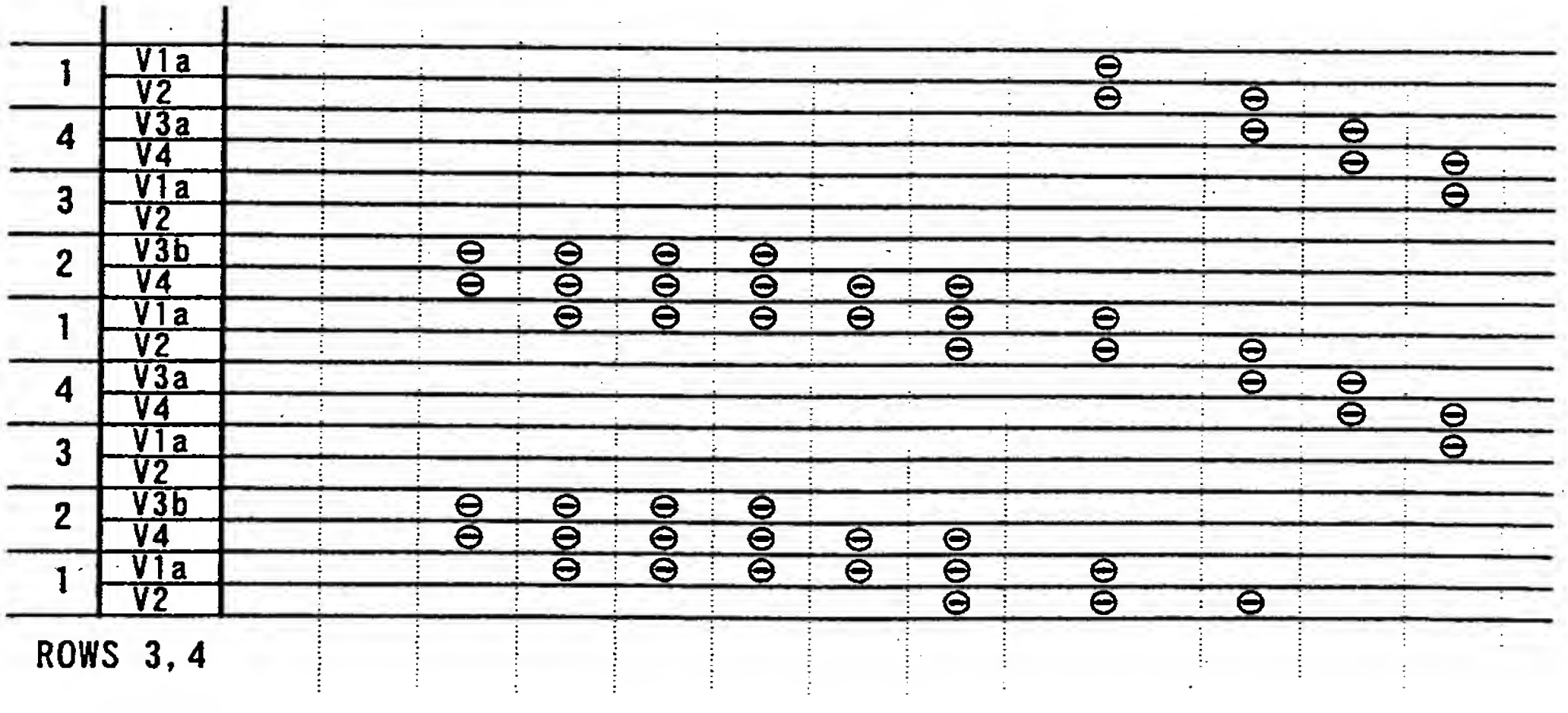

1 V1a
V2
4 V3a
V4
3 V1a
V2
2 V3b
V4
1 V1a
V2
4 V3a
V4
3 V1a
V2
2 V3b
V4
1 V1a
V2
ROWS 3, 4

FIG. 14

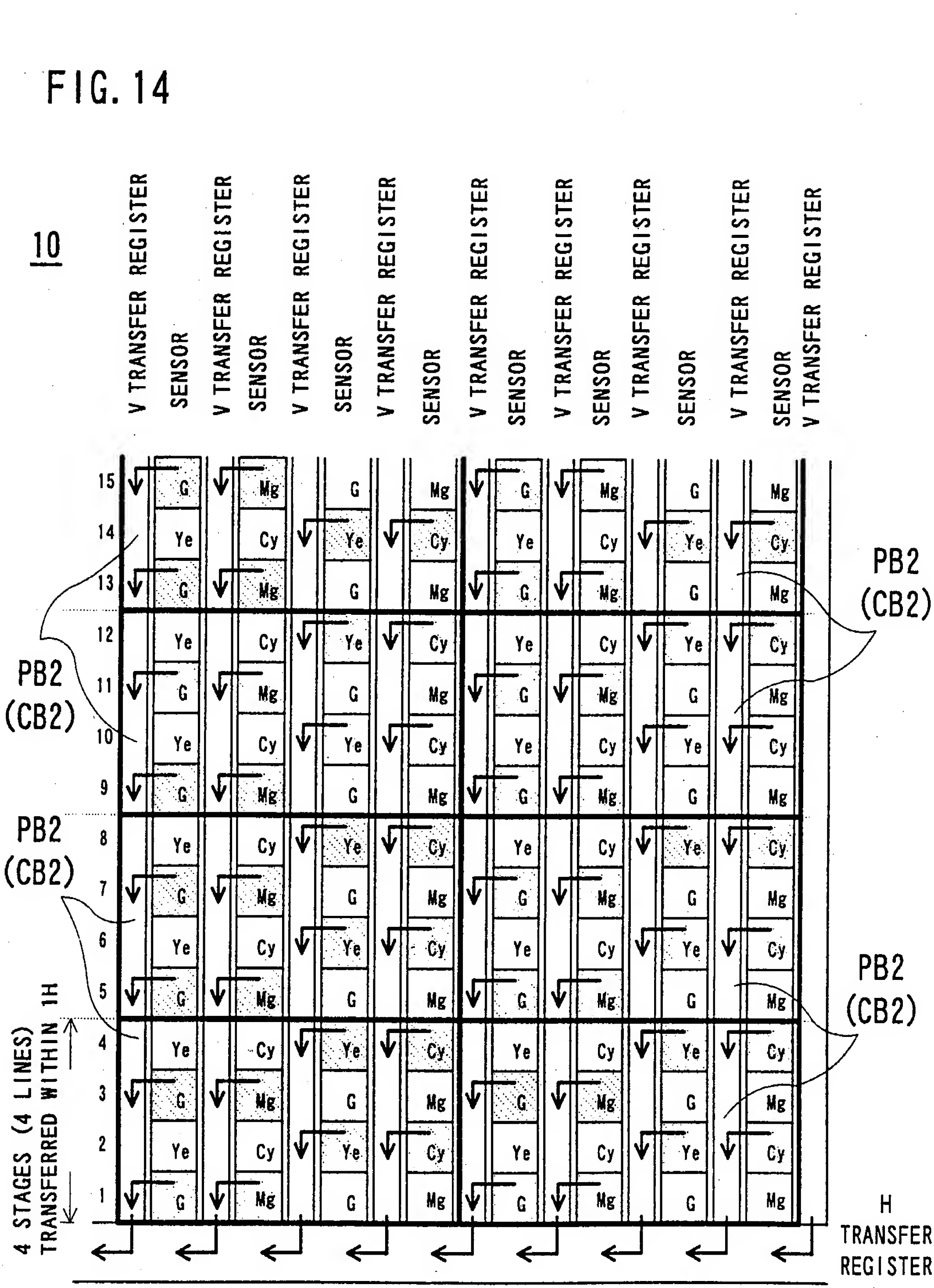
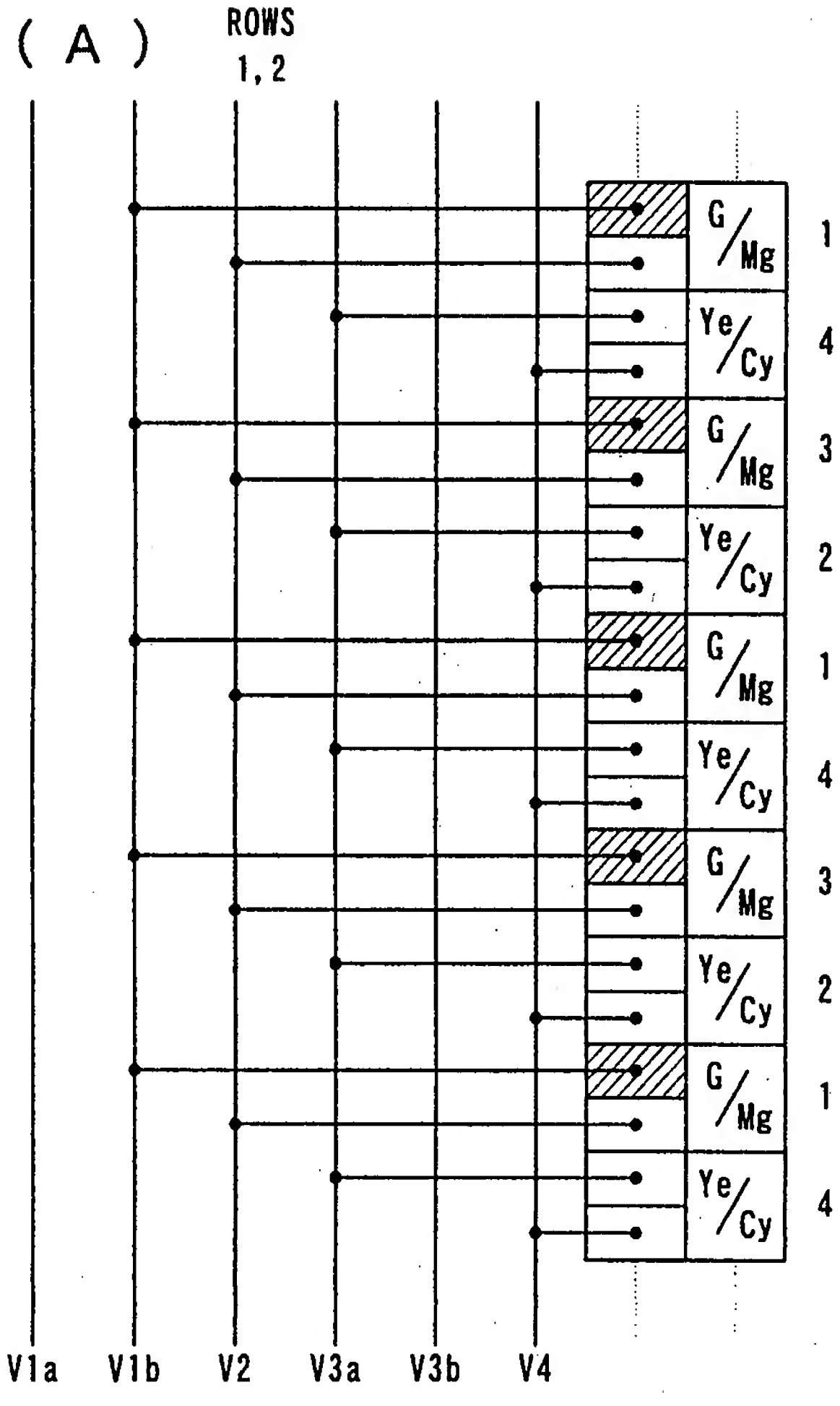

10
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
G
Mg
Ye
Cy
PB2
(CB2)
PB2
(CB2)
PB2
(CB2)
PB2
(CB2)
4 STAGES (4 LINES)
TRANSFERRED WITHIN 1H
H
TRANSFER
REGISTER

FIG. 15


(A)
ROWS
1, 2
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
4
3
2
1
4
3
2
1
4
V1a
V1b
V2
V3a
V3b
V4

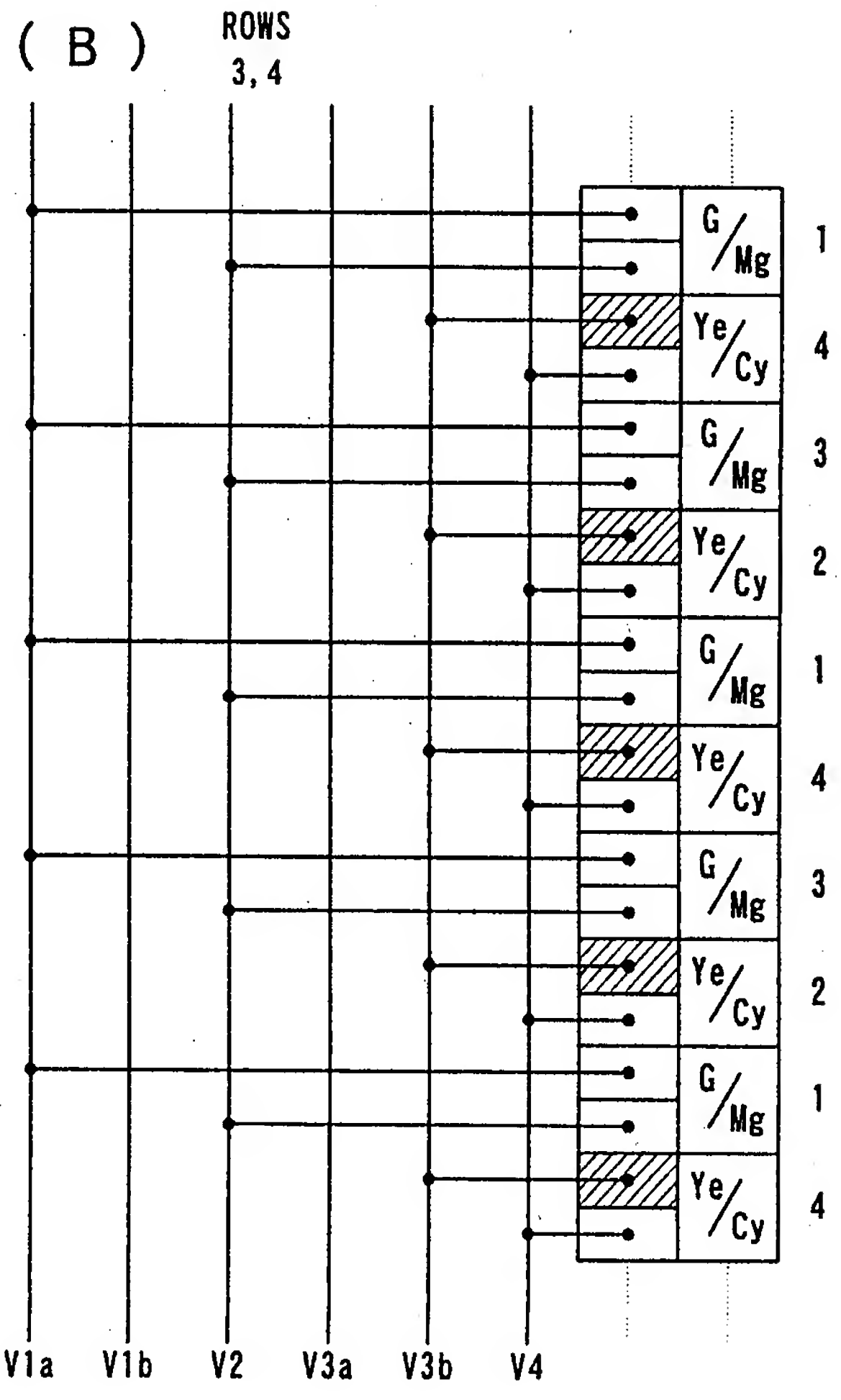
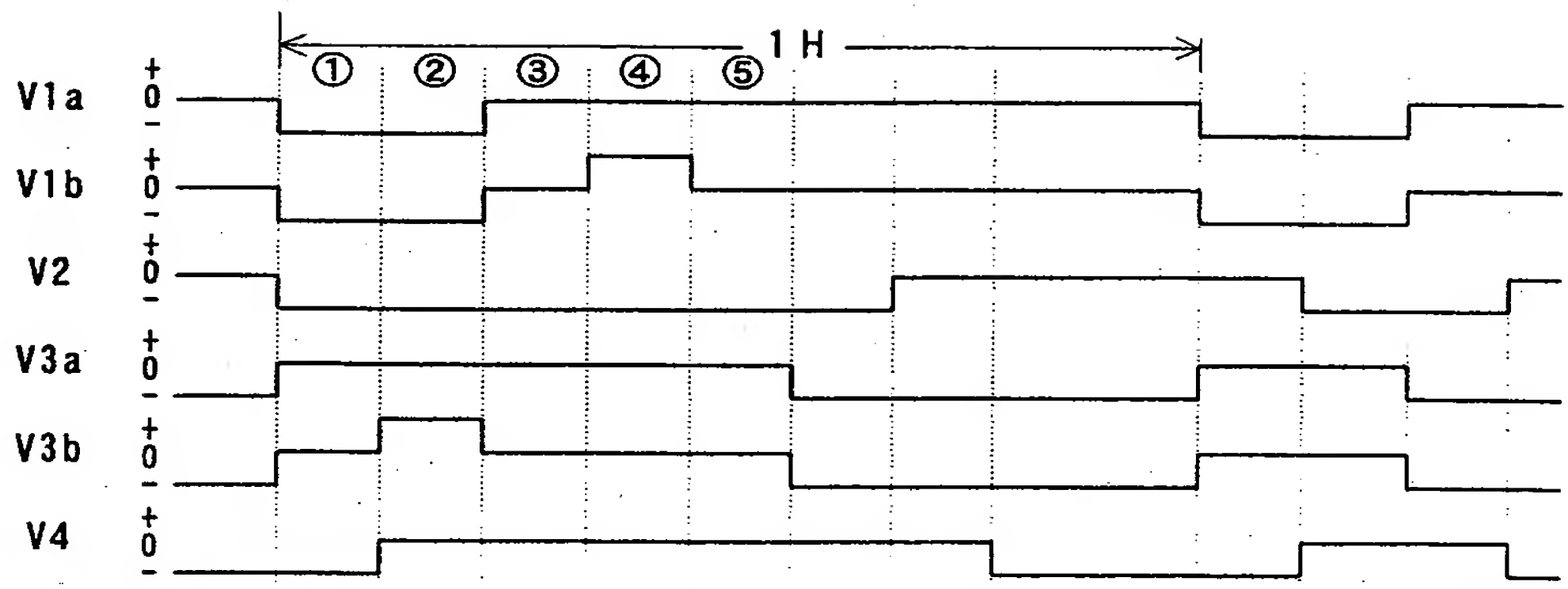

(B)
ROWS
3, 4
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
4
3
2
1
4
3
2
1
4
V1a
V1b
V2
V3a
V3b
V4

FIG. 16

(A)



(B)

		ROWS 1, 2
1	V1b	⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖
4	V3a	⊖ ⊖ ⊖ ⊖
	V4	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
3	V1b	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖
2	V3a	⊖ ⊖ ⊖ ⊖
	V4	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
1	V1b	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖
4	V3a	⊖ ⊖ ⊖ ⊖
	V4	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
3	V1b	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖
2	V3a	⊖ ⊖ ⊖ ⊖
	V4	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
1	V1b	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖

(C)

		ROWS 3, 4
1	V1a	⊖
	V2	⊖ ⊖
4	V3b	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V4	⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖
3	V1a	⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖ ⊖
2	V3b	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V4	⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖
1	V1a	⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖ ⊖
4	V3b	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V4	⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖
3	V1a	⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖ ⊖
2	V3b	⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V4	⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖
1	V1a	⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖ ⊖
	V2	⊖ ⊖ ⊖ ⊖

FIG. 17

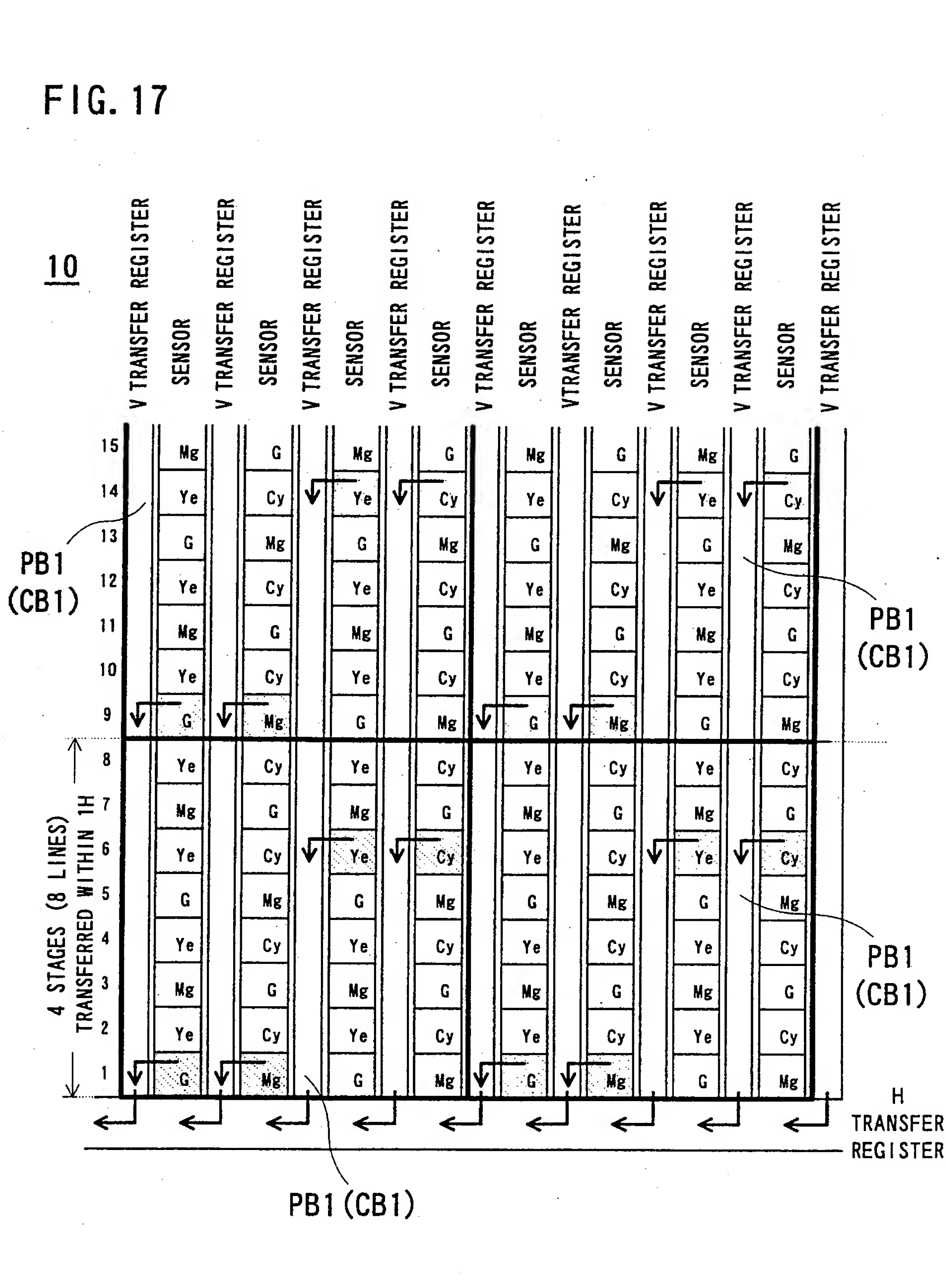

10
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
VTRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Mg
G
Ye
Cy
PB1
(CB1)
4 STAGES (8 LINES) TRANSFERRED WITHIN 1H
H TRANSFER REGISTER
PB1 (CB1)

FIG. 18

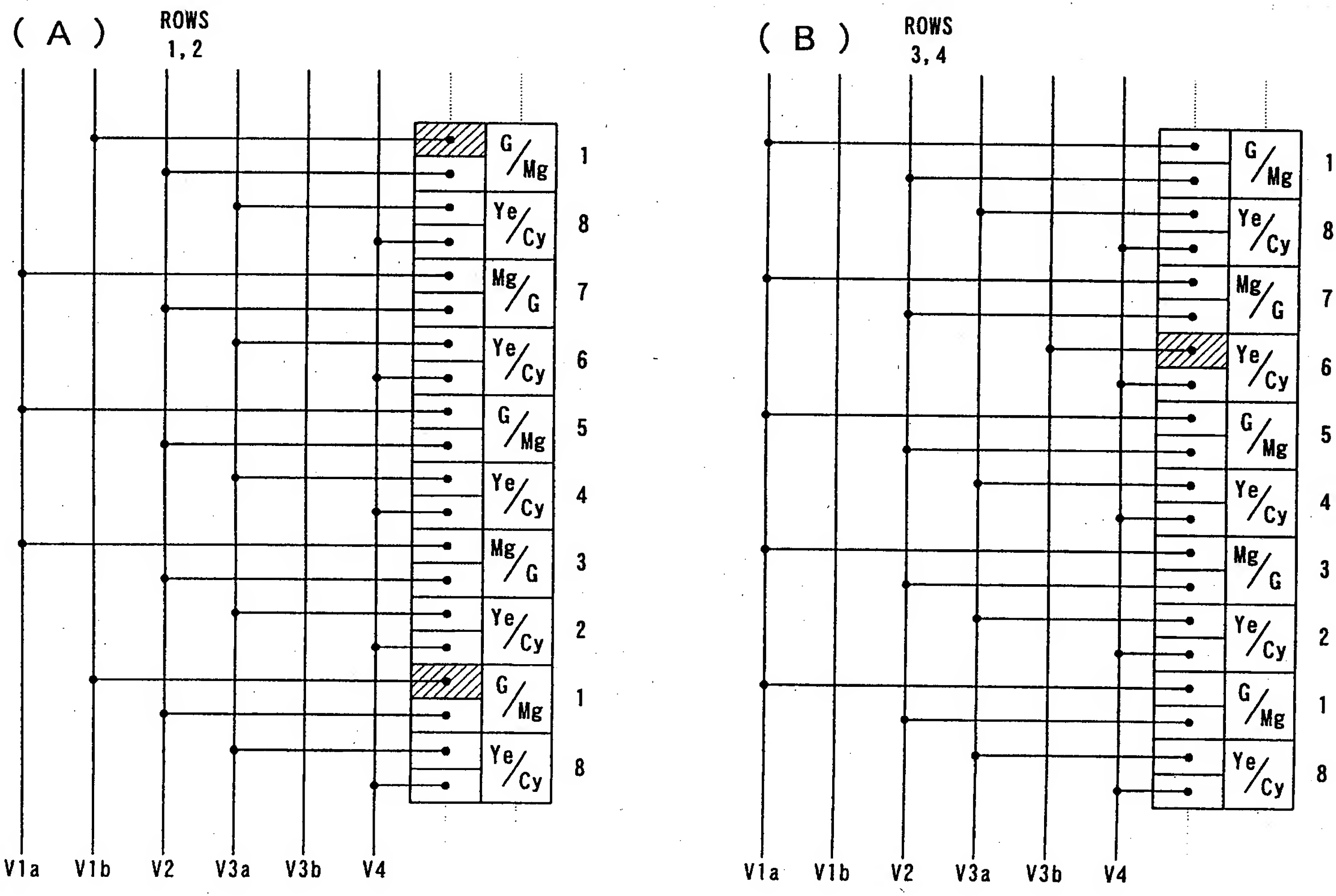
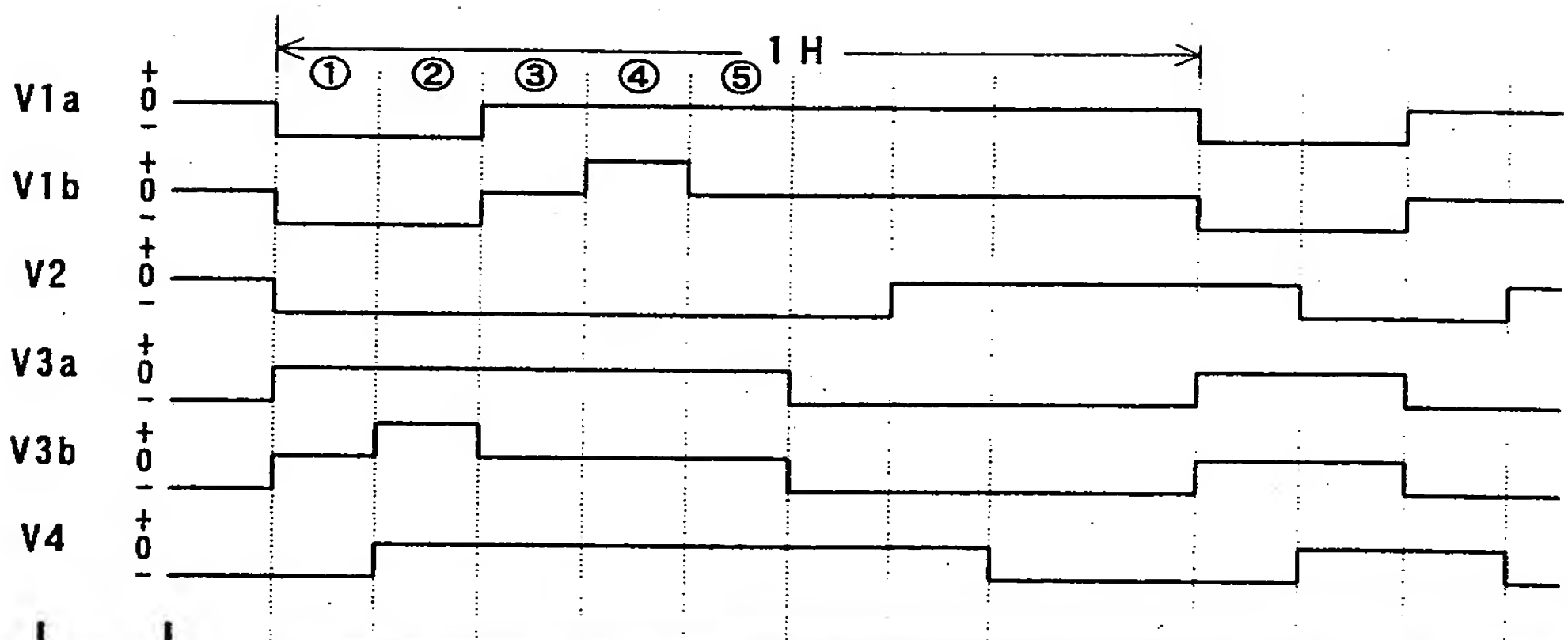
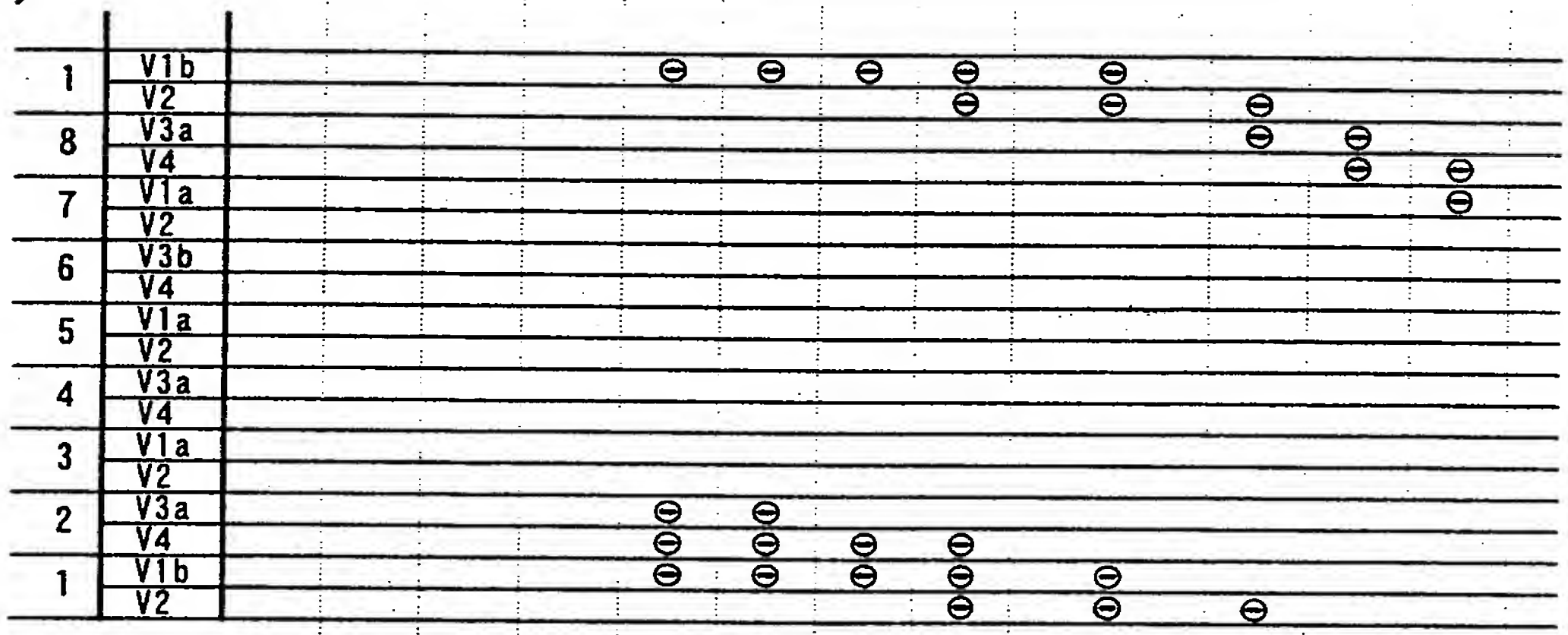

(A)
ROWS
1, 2
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
1
8
7
6
5
4
3
2
1
8
V1a
V1b
V2
V3a
V3b
V4
(B)
ROWS
3, 4
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
1
8
7
6
5
4
3
2
1
8
V1a
V1b
V2
V3a
V3b
V4

FIG. 19

(A)

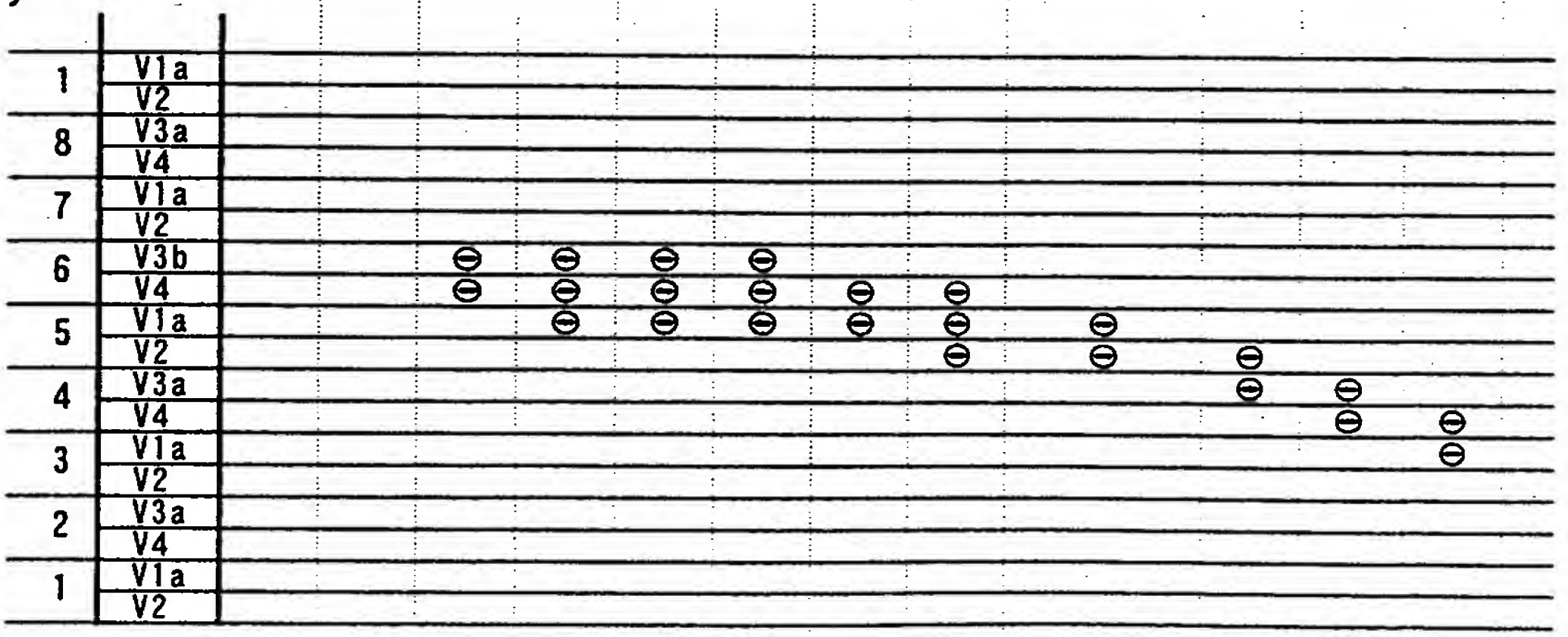


(B)



ROWS 1, 2

(C)



ROWS 3, 4

FIG. 20

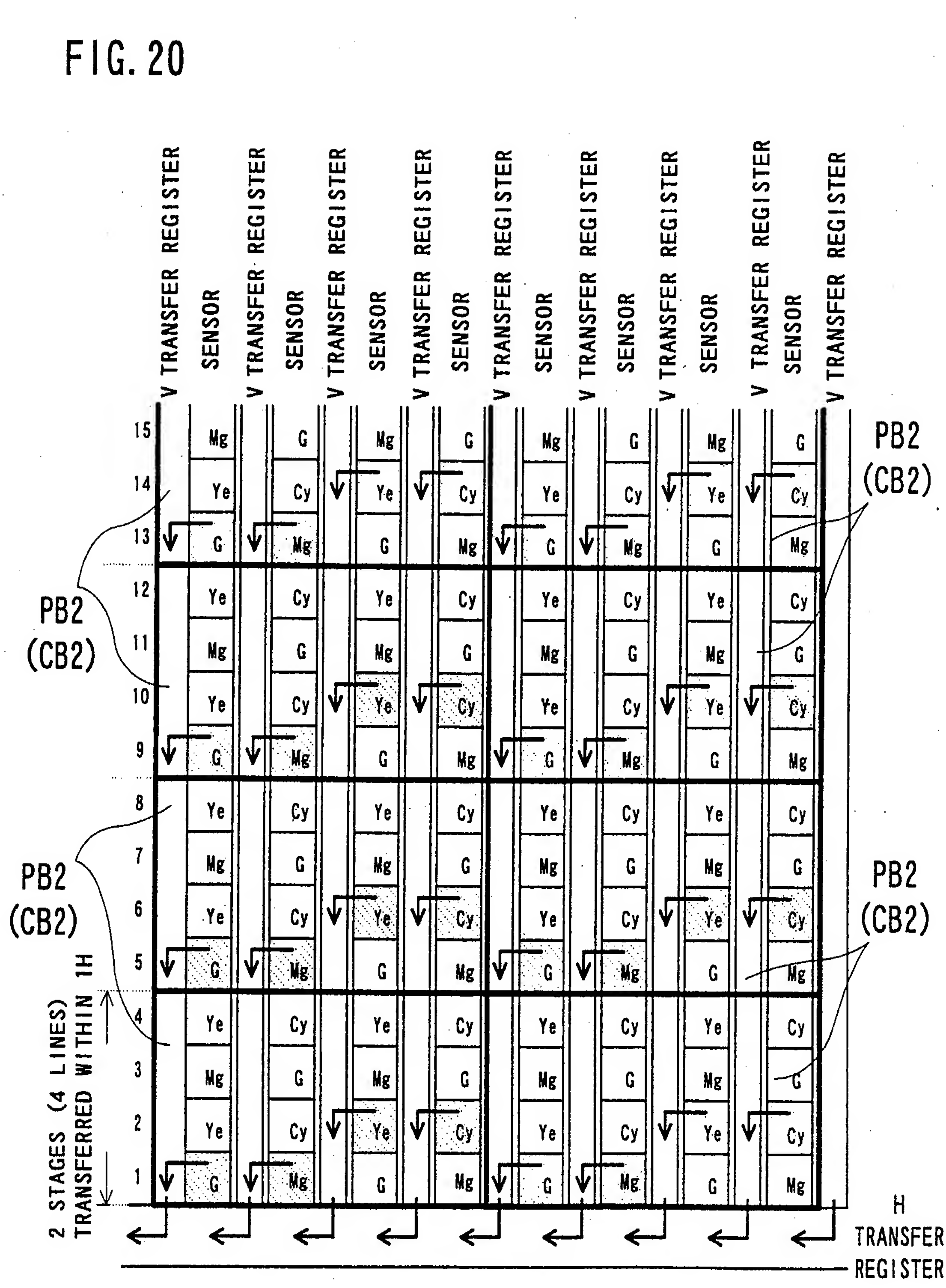

V TRANSFER REGISTER
SENSOR
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Mg
G
Ye
Cy
PB2
(CB2)
2 STAGES (4 LINES)
TRANSFERRED WITHIN 1H
H
TRANSFER
REGISTER

FIG. 21

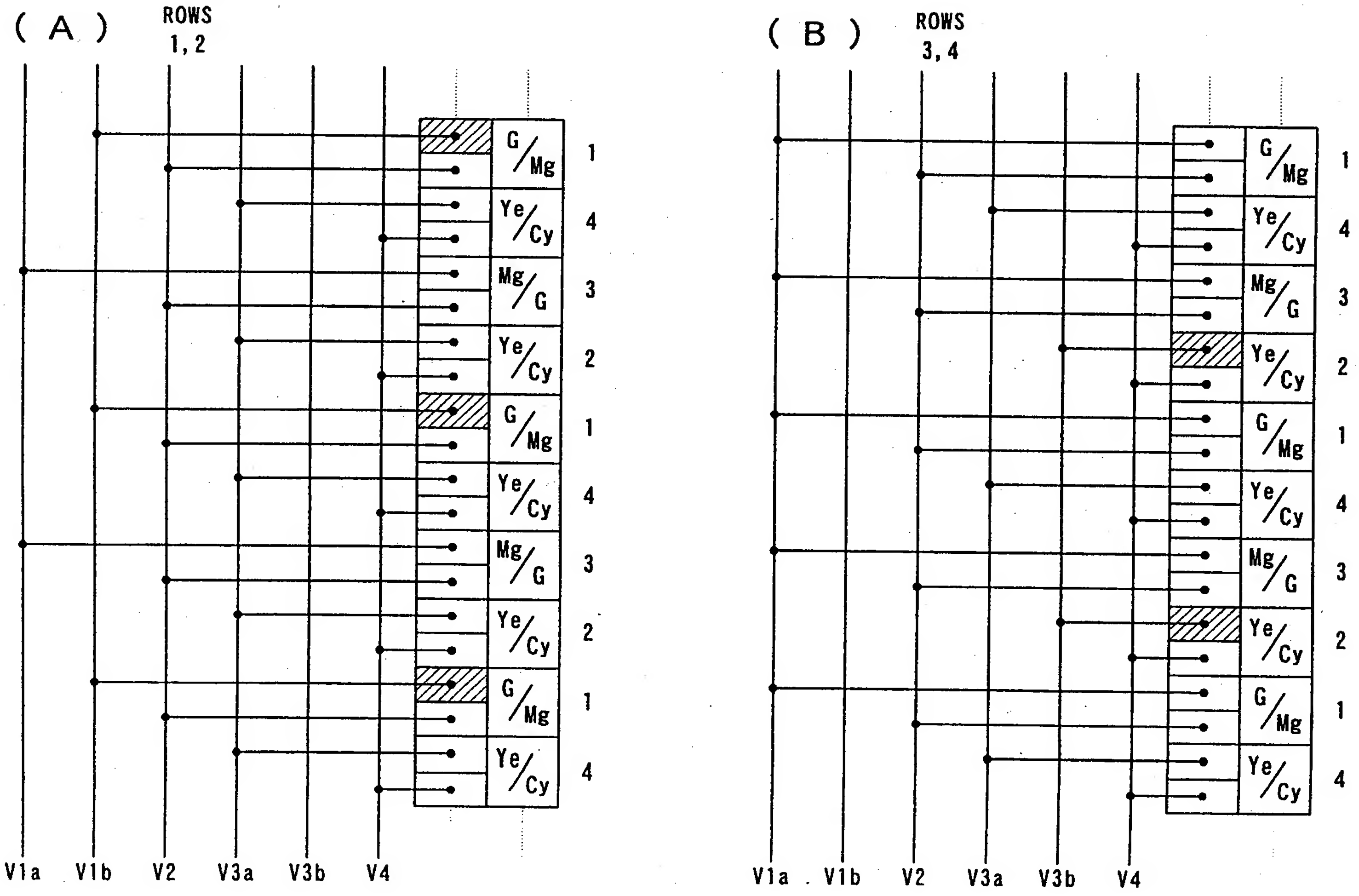
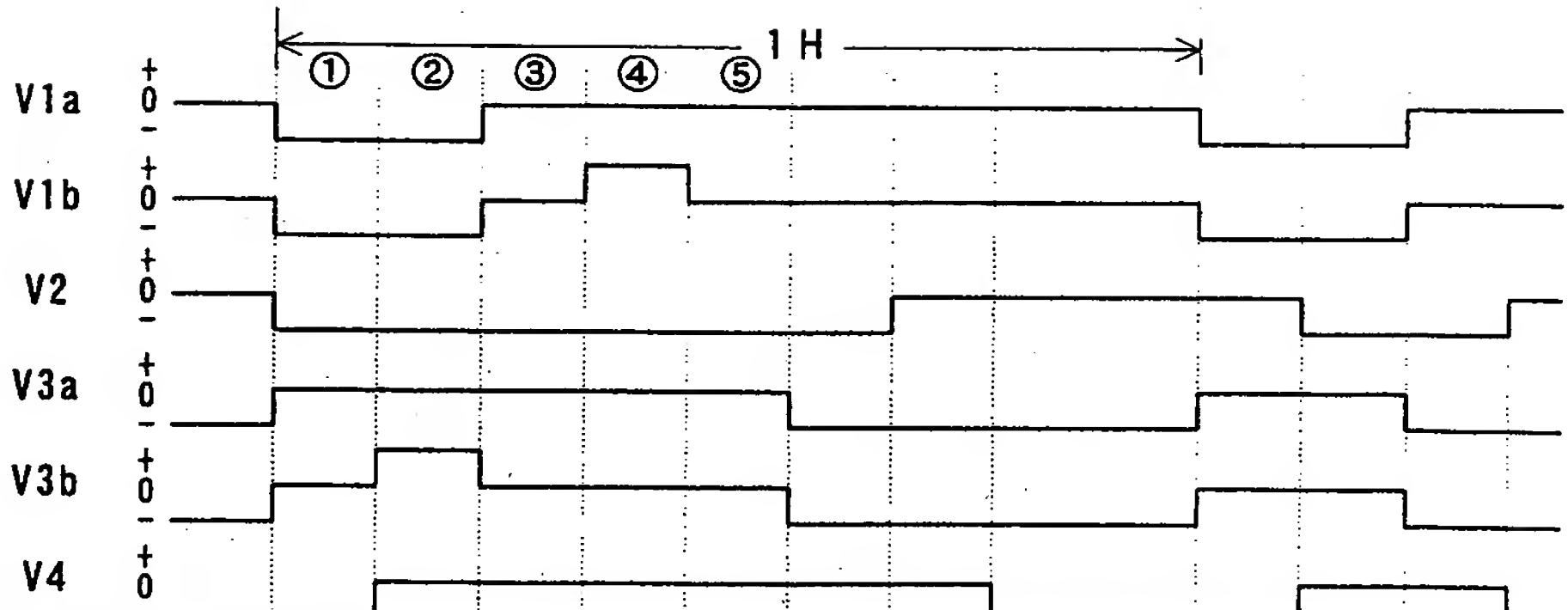
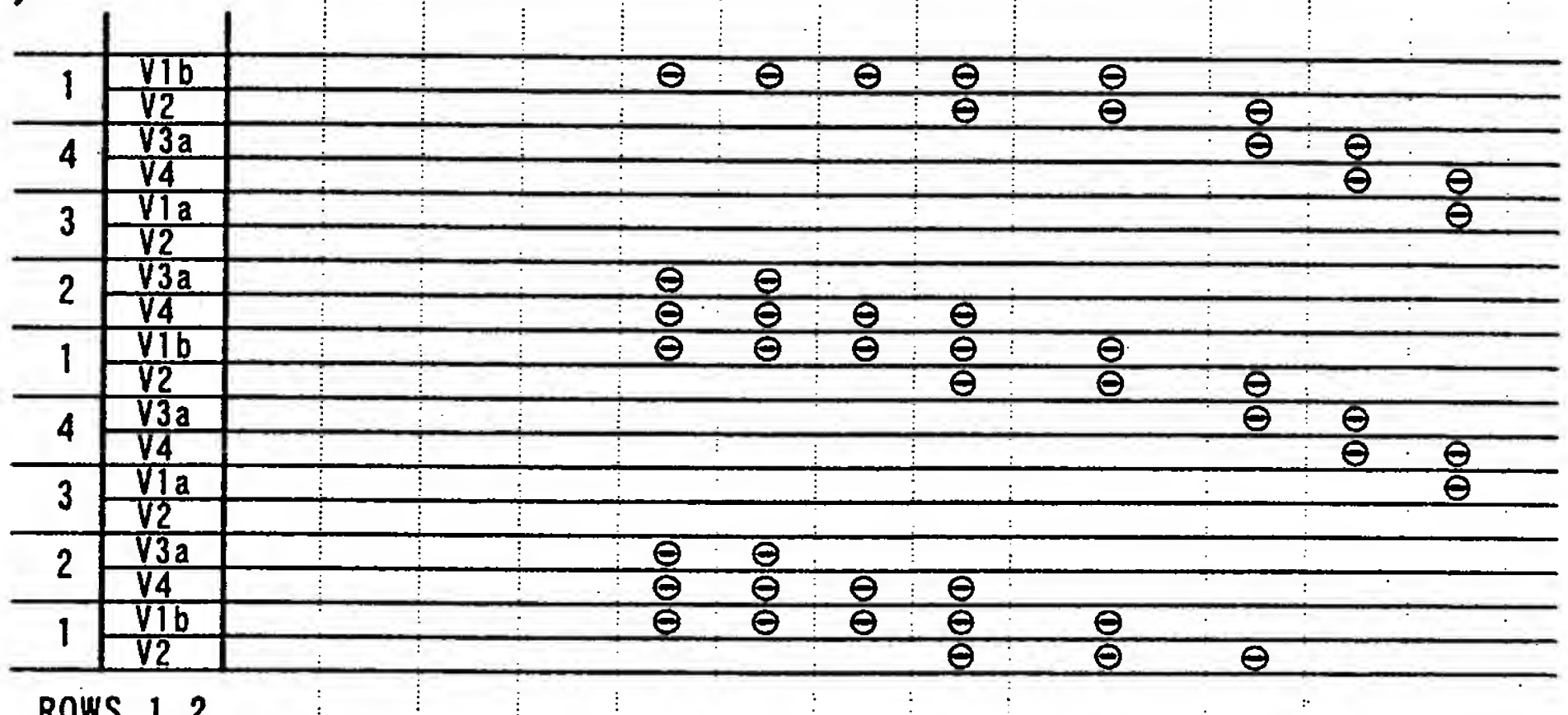

(A)
ROWS
1, 2
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
1
4
3
2
1
4
3
2
1
4
V1a
V1b
V2
V3a
V3b
V4
(B)
ROWS
3, 4
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
1
4
3
2
1
4
3
2
1
4
V1a
V1b
V2
V3a
V3b
V4

FIG. 22

(A)



(B)



ROWS 1, 2

(C)

ROWS 3, 4

FIG. 23

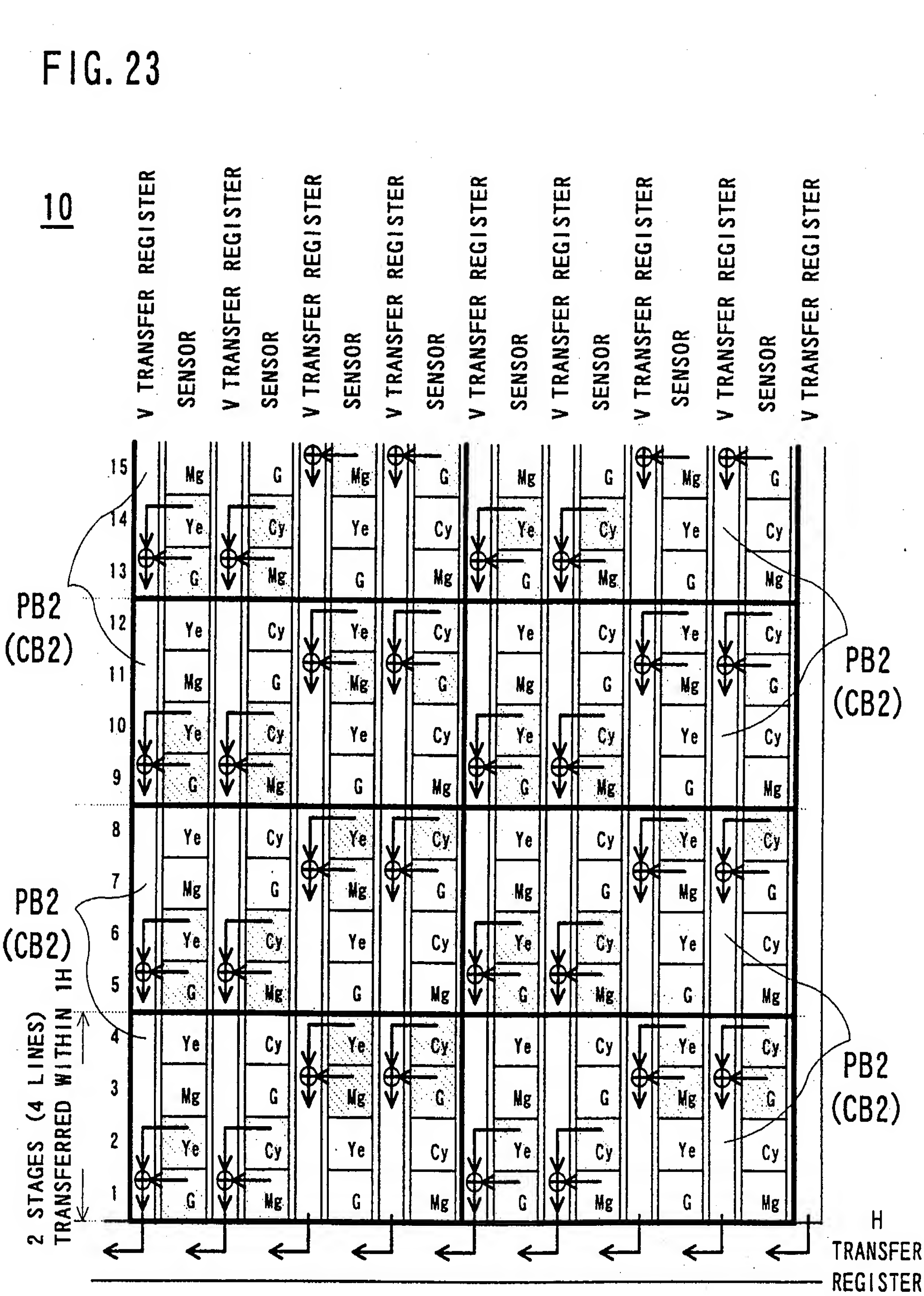

10
V TRANSFER REGISTER
SENSOR
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Mg
G
Ye
Cy
PB2
(CB2)
2 STAGES (4 LINES)
TRANSFERRED WITHIN 1H
H
TRANSFER
REGISTER

FIG. 24

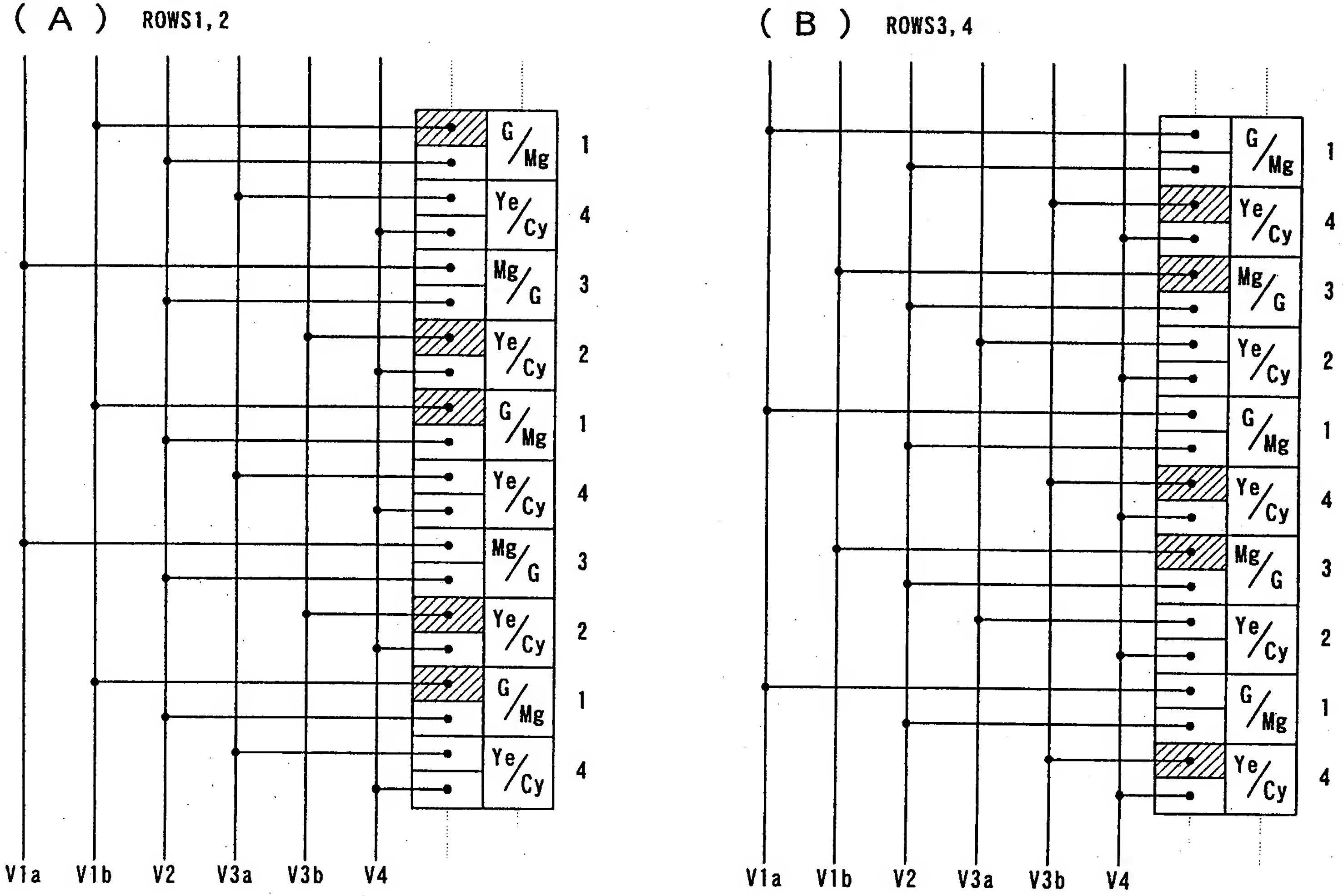
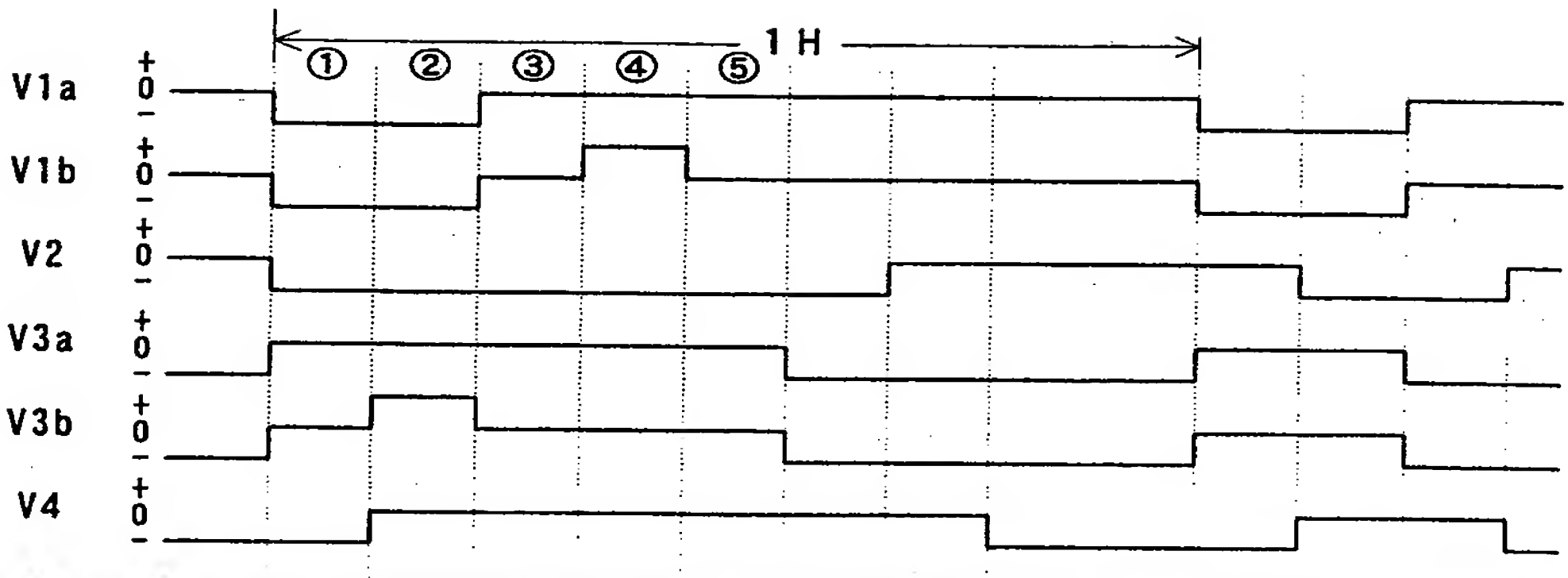
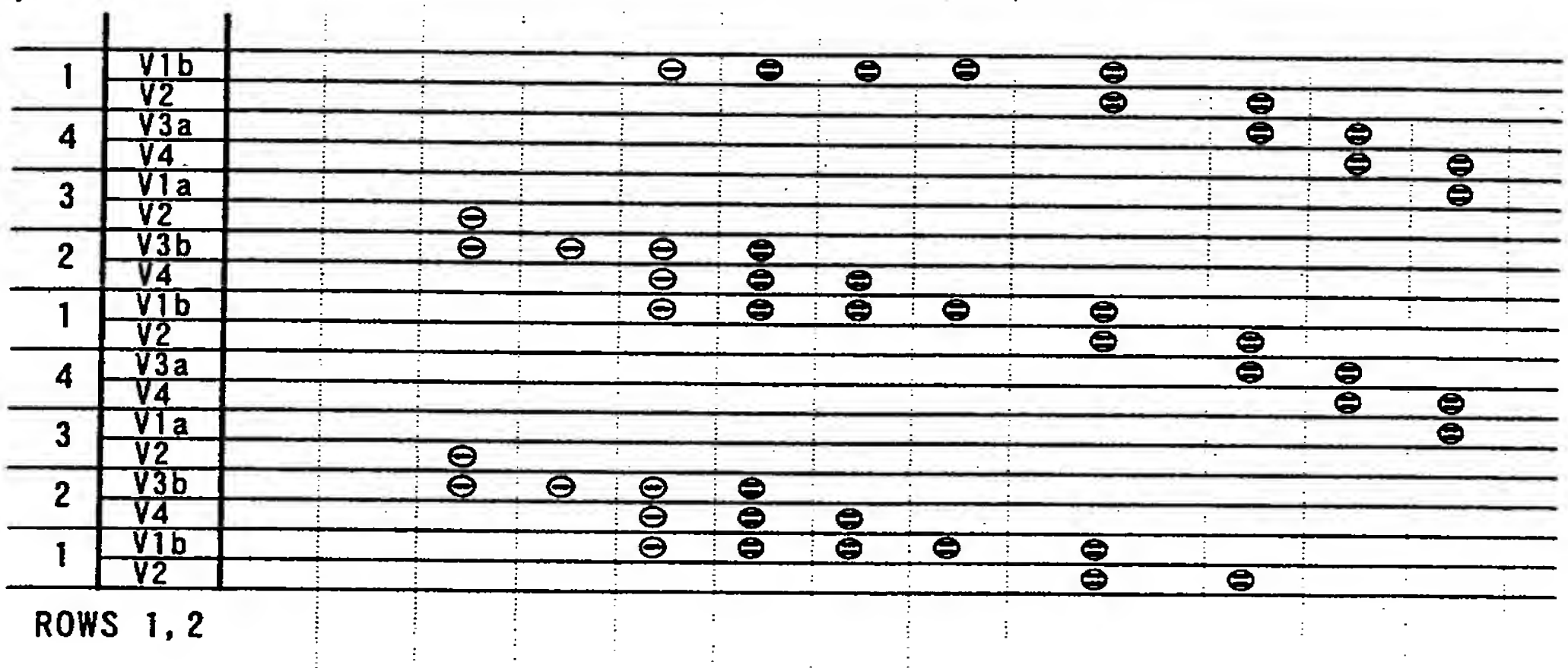

(A) ROWS1, 2
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
4
3
2
1
4
V1a
V1b
V2
V3a
V3b
V4
(B) ROWS3, 4
G/Mg
Ye/Cy
Mg/G
Ye/Cy
G/Mg
Ye/Cy
1
4
3
2
1
4
V1a
V1b
V2
V3a
V3b
V4

FIG. 25

(A)

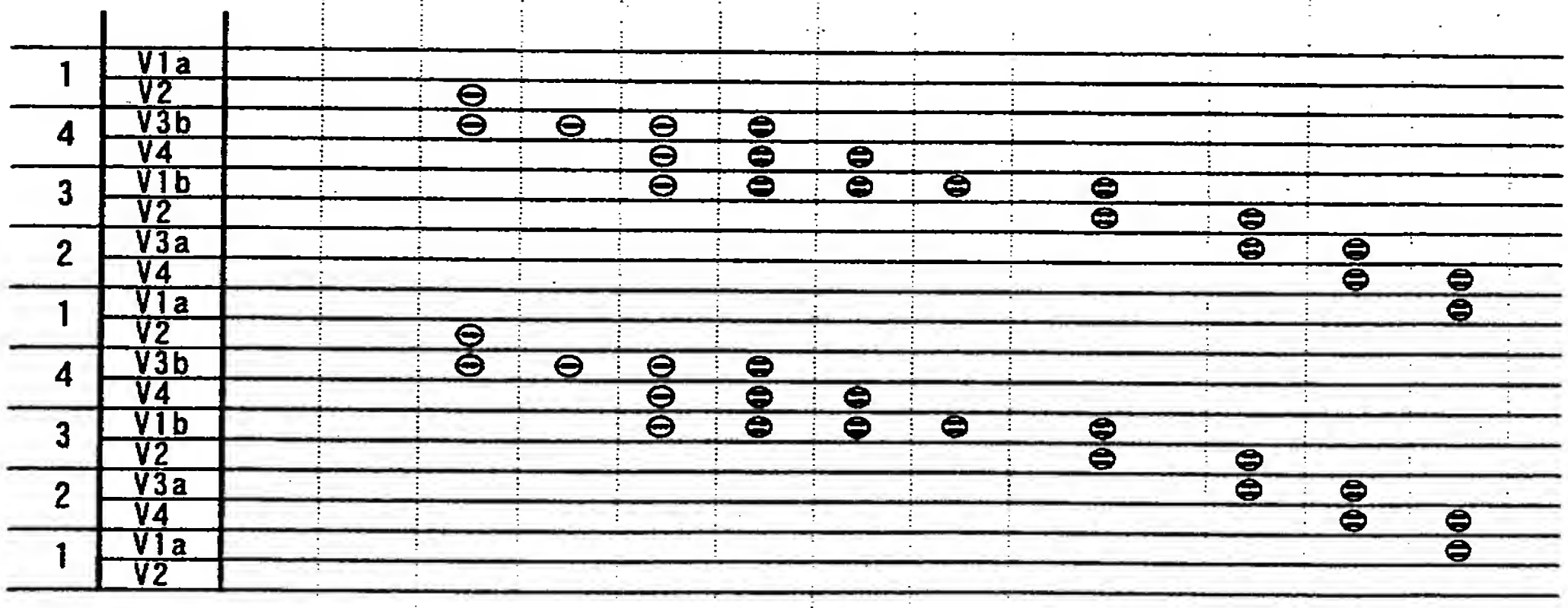


(B)



ROWS 1, 2

(C)



ROWS 3, 4

FIG. 26

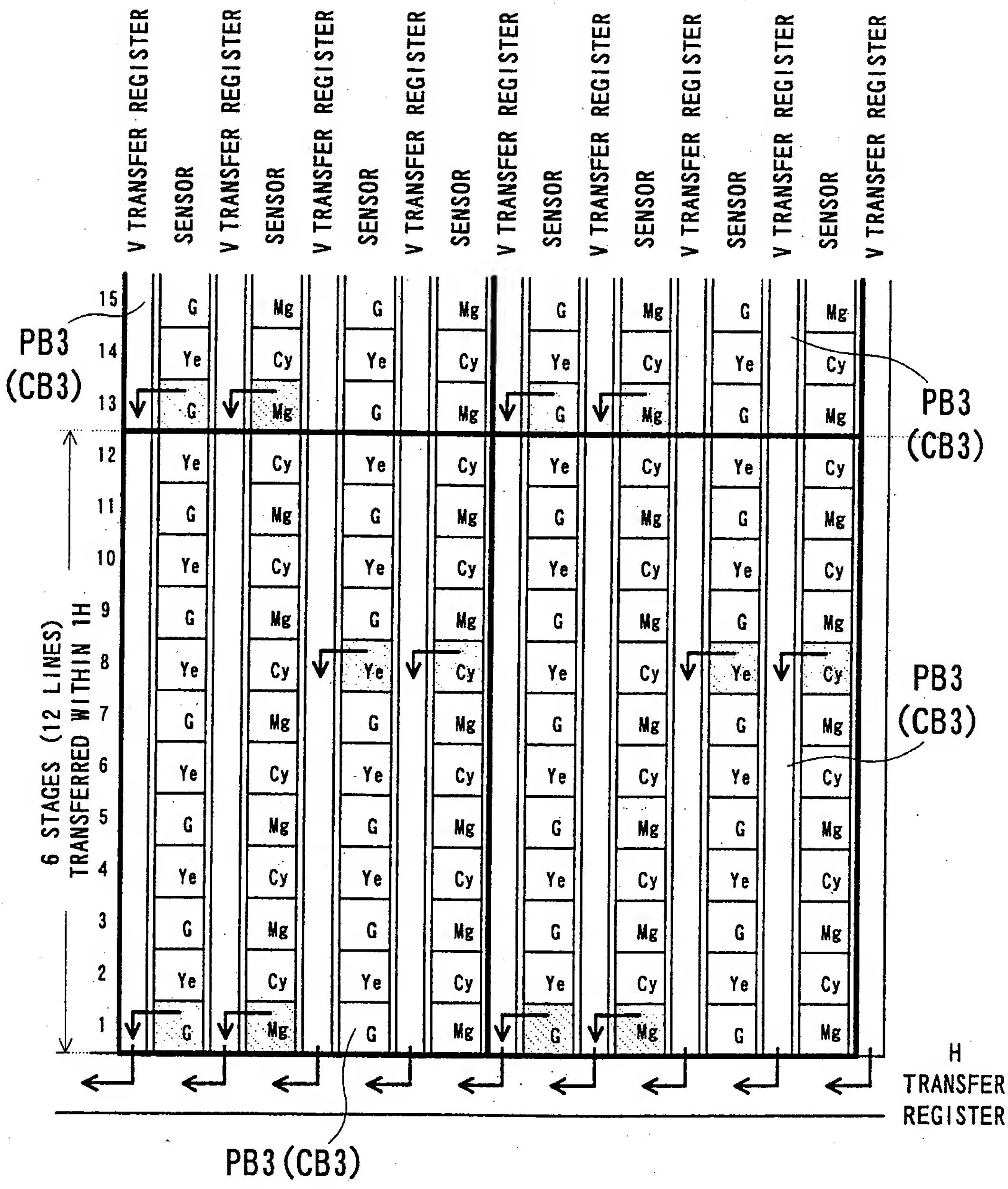

V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
G
Mg
Ye
Cy
PB3
(CB3)
PB3
(CB3)
PB3
(CB3)
6 STAGES (12 LINES)
TRANSFERRED WITHIN 1H
H
TRANSFER
REGISTER
PB3 (CB3)

FIG. 27

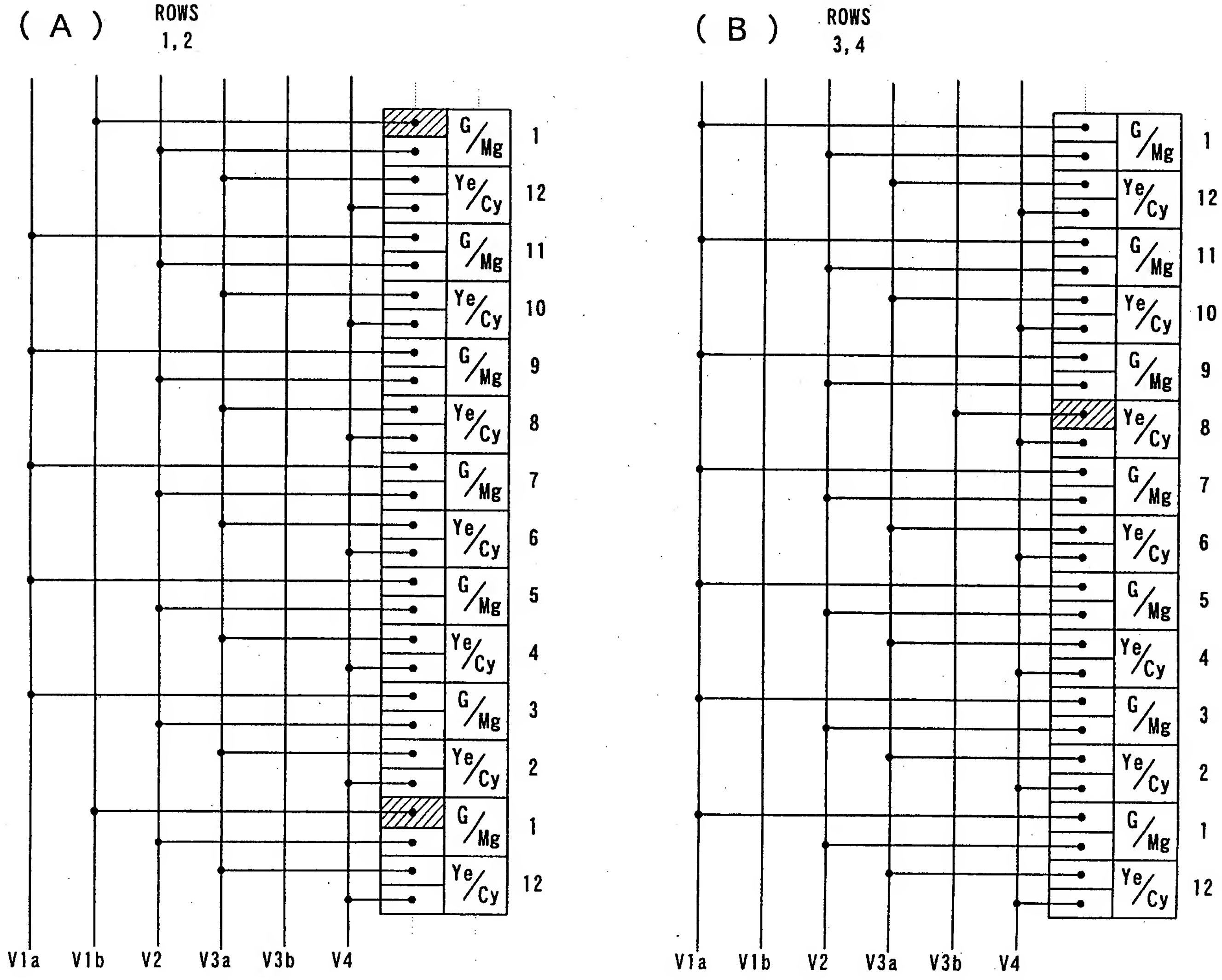

(A)
ROWS
1, 2
G/Mg
Ye/Cy
1
12
11
10
9
8
7
6
5
4
3
2
1
12
V1a
V1b
V2
V3a
V3b
V4
(B)
ROWS
3, 4
G/Mg
Ye/Cy
1
12
11
10
9
8
7
6
5
4
3
2
1
12
V1a
V1b
V2
V3a
V3b
V4

FIG. 28

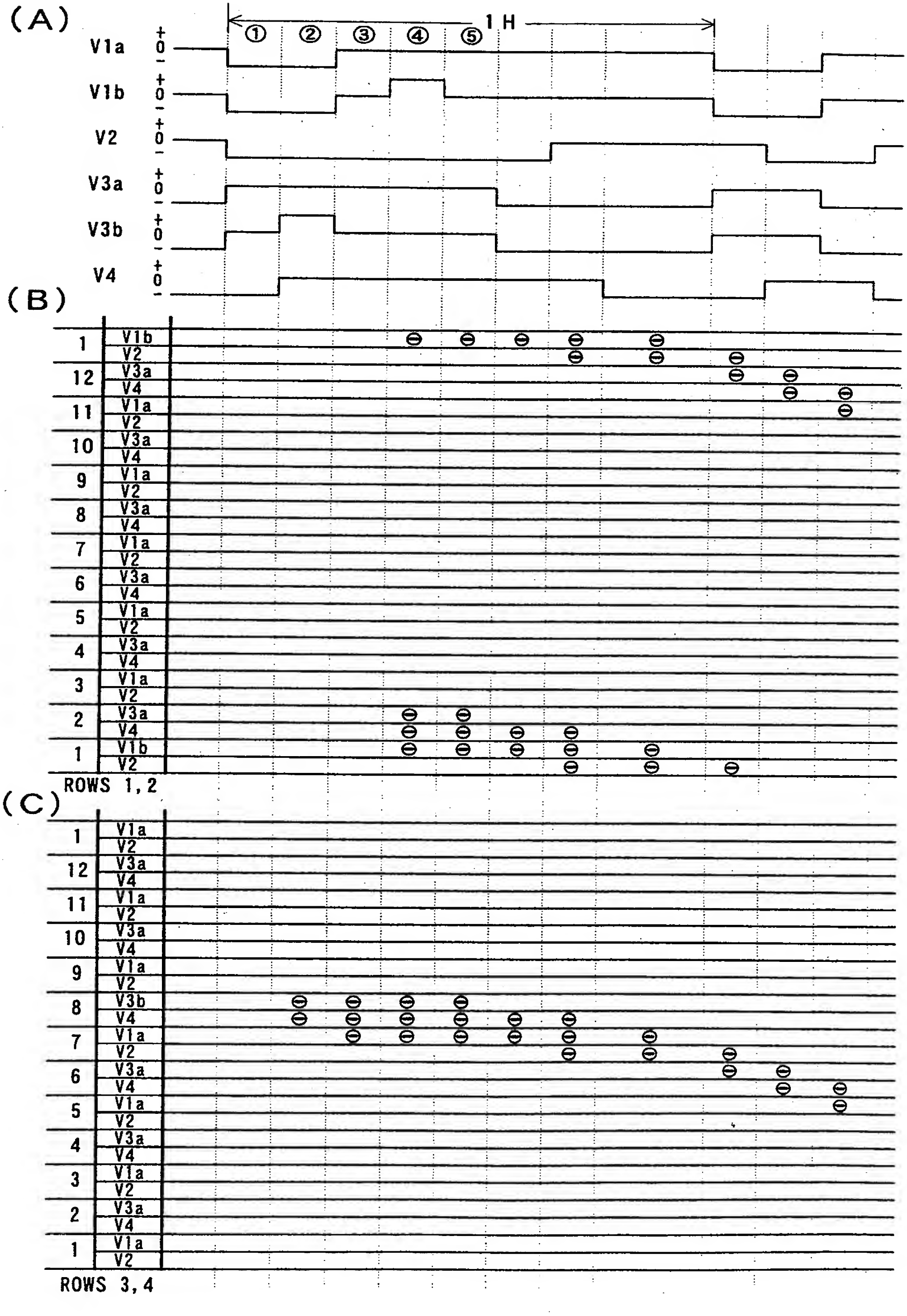

(A)
1H
①
②
③
④
⑤
V1a
V1b
V2
V3a
V3b
V4
+
0
−
(B)
1
V1b
V2
12
V3a
V4
11
V1a
V2
10
V3a
V4
9
V1a
V2
8
V3a
V4
7
V1a
V2
6
V3a
V4
5
V1a
V2
4
V3a
V4
3
V1a
V2
2
V3a
V4
1
V1b
V2
ROWS 1, 2
(C)
1
V1a
V2
12
V3a
V4
11
V1a
V2
10
V3a
V4
9
V1a
V2
8
V3b
V4
7
V1a
V2
6
V3a
V4
5
V1a
V2
4
V3a
V4
3
V1a
V2
2
V3a
V4
1
V1a
V2
ROWS 3, 4

FIG. 29

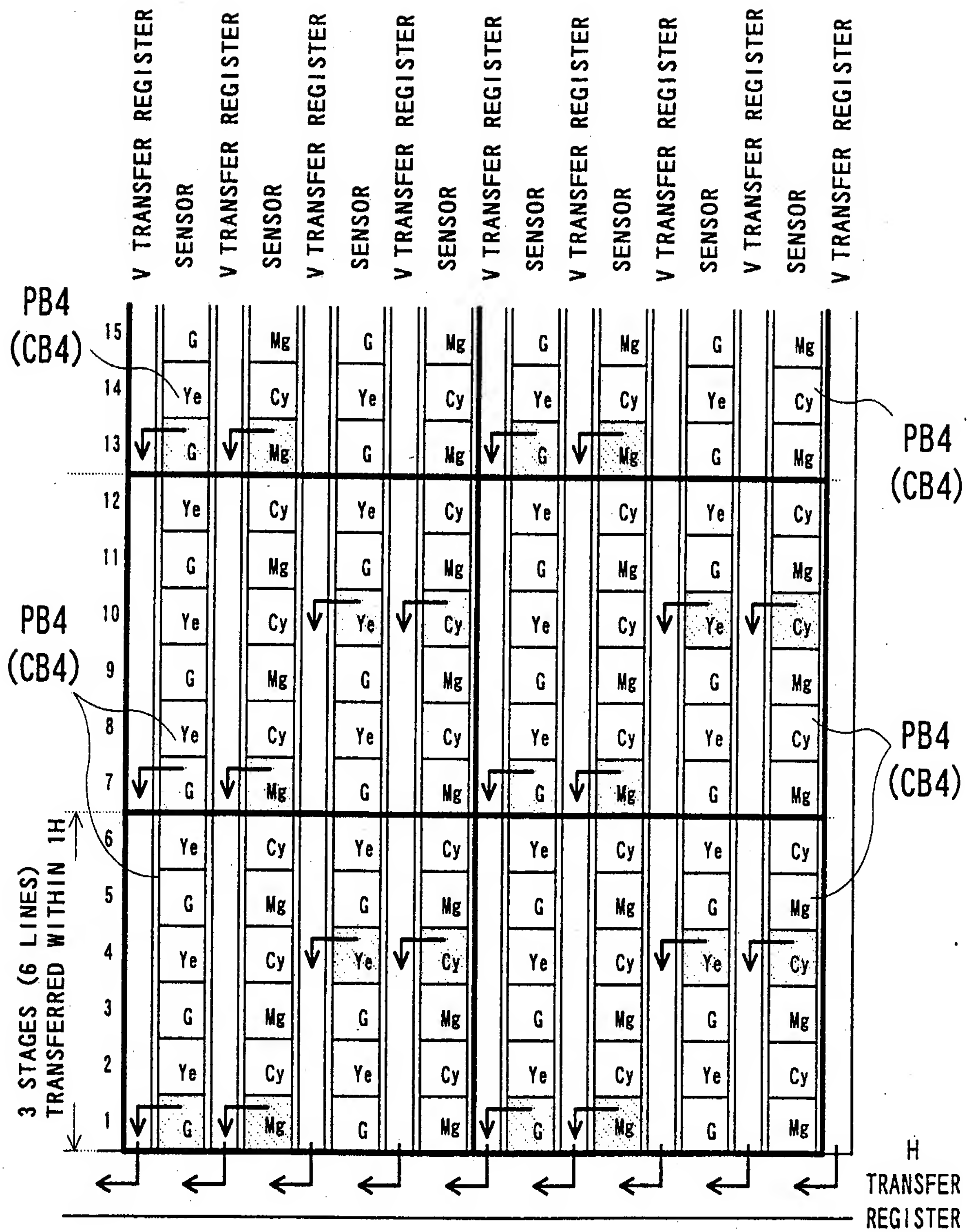

V TRANSFER REGISTER
SENSOR
PB4 (CB4)
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
G
Mg
Ye
Cy
3 STAGES (6 LINES) TRANSFERRED WITHIN 1H
H TRANSFER REGISTER

FIG. 30

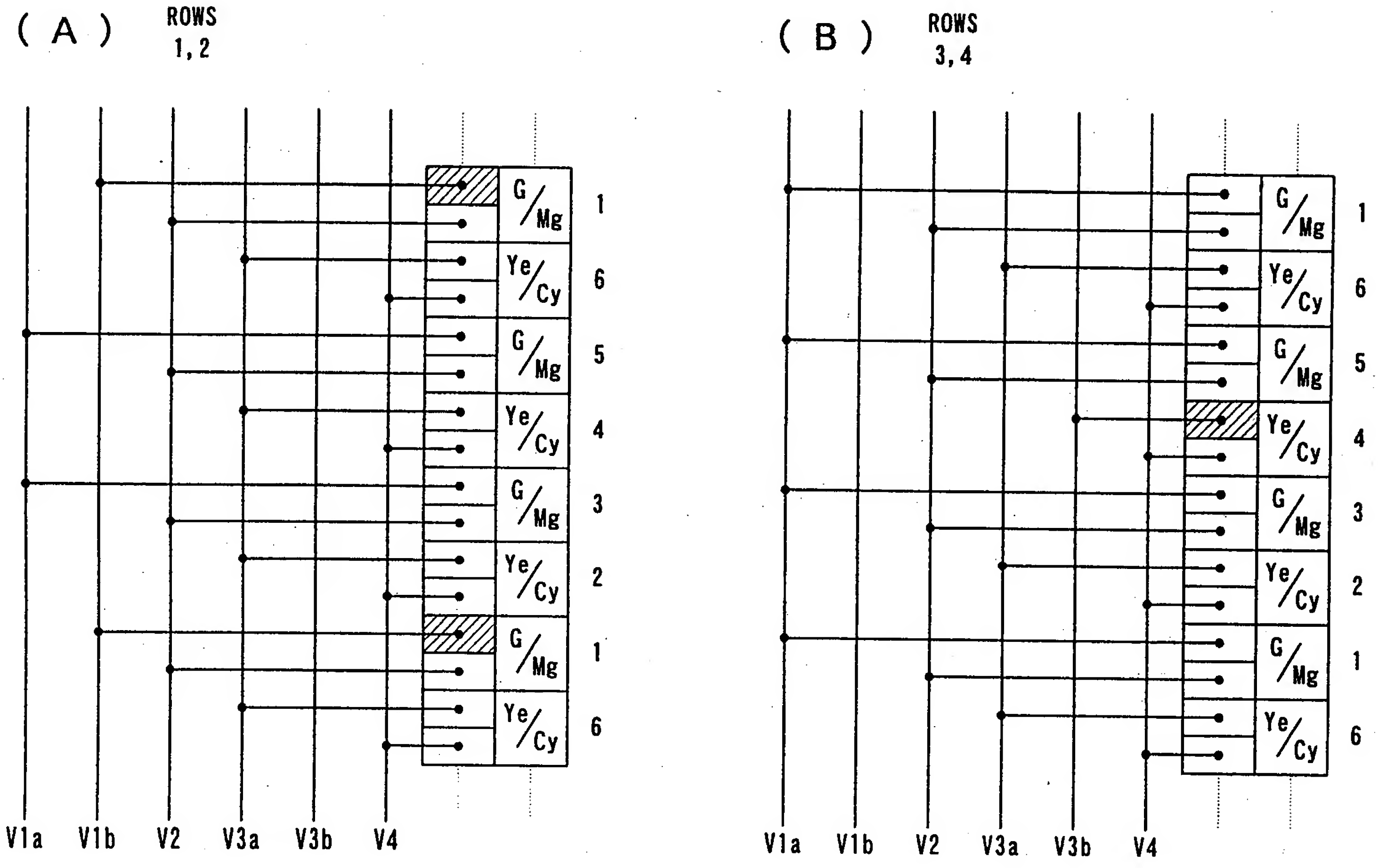
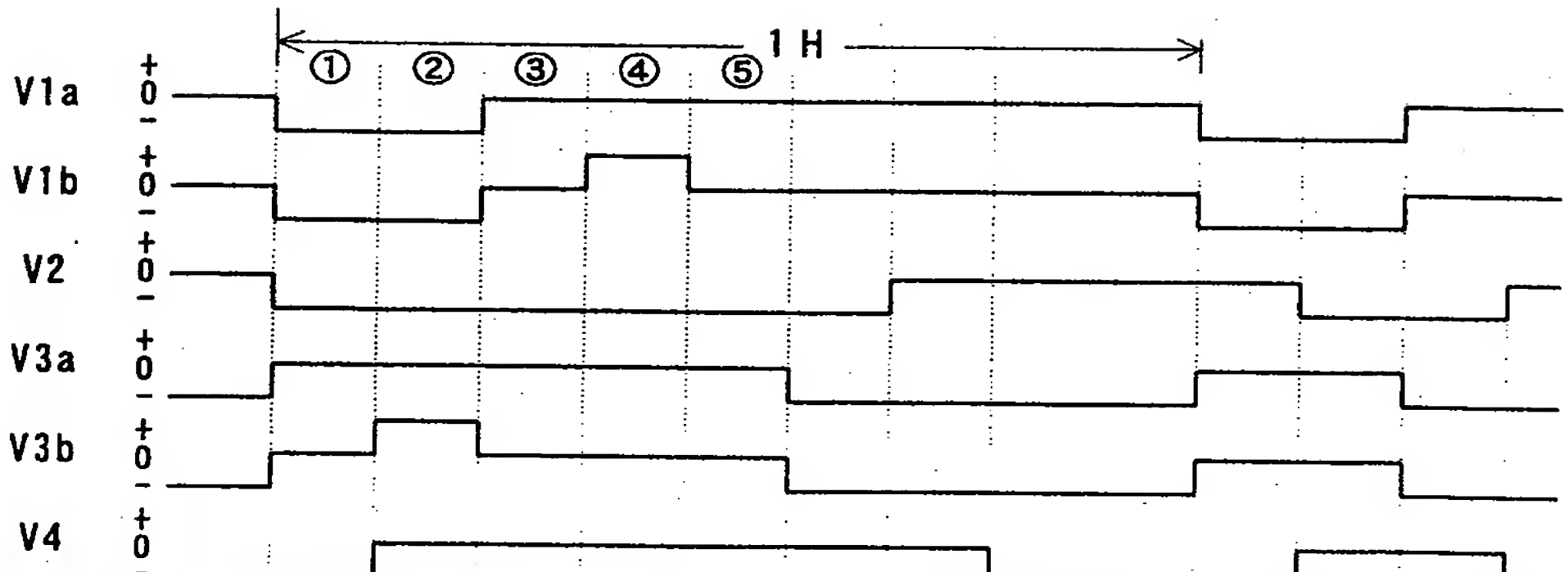
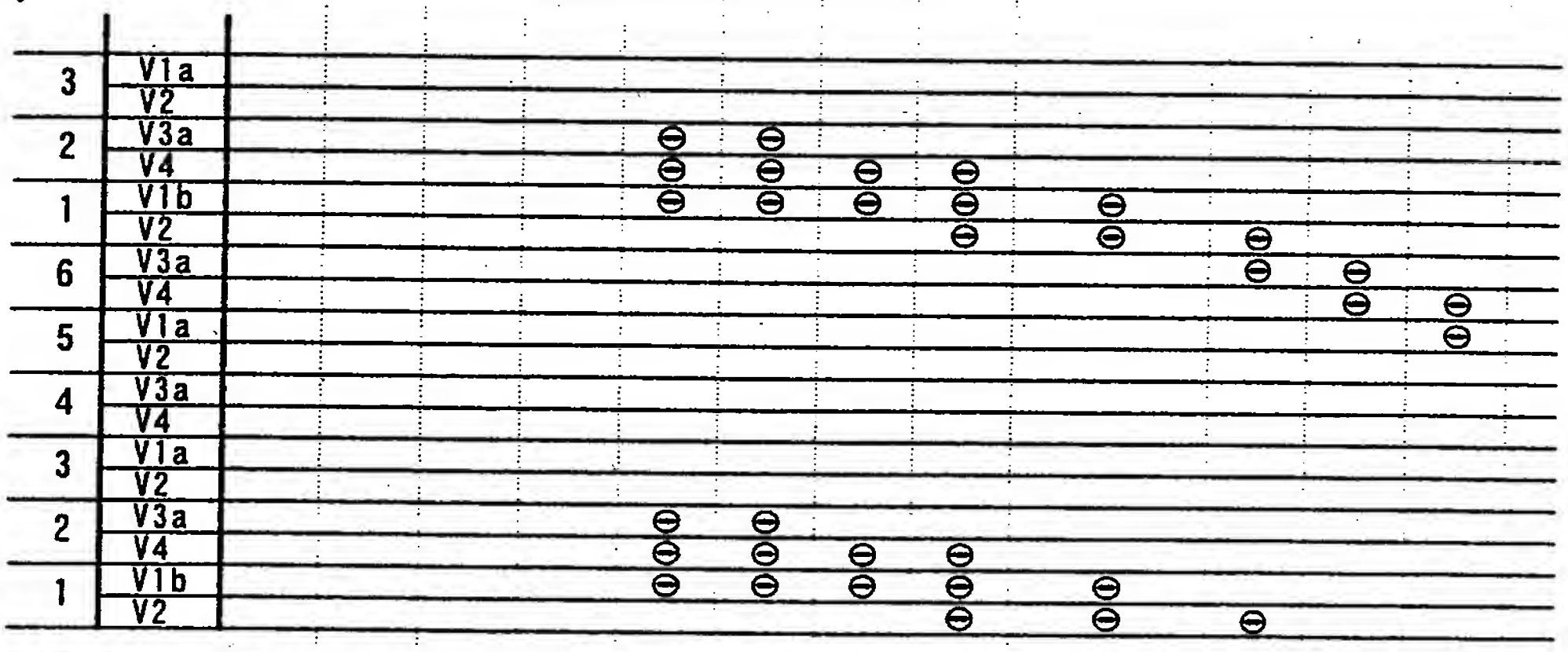

(A)
ROWS
1, 2
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
6
5
4
3
2
1
6
V1a
V1b
V2
V3a
V3b
V4
(B)
ROWS
3, 4
G/Mg
Ye/Cy
G/Mg
Ye/Cy
G/Mg
Ye/Cy
1
6
5
4
3
2
1
6
V1a
V1b
V2
V3a
V3b
V4

FIG. 31

(A)

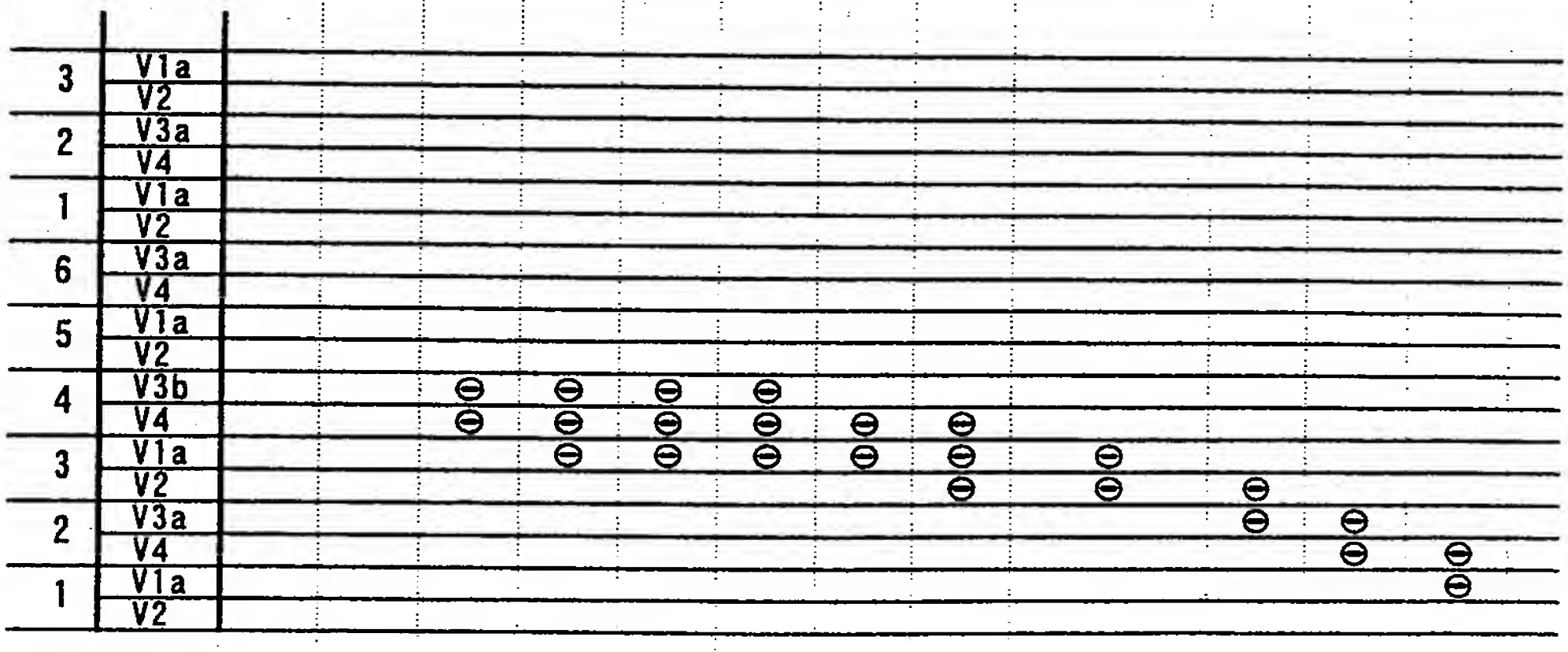


(B)



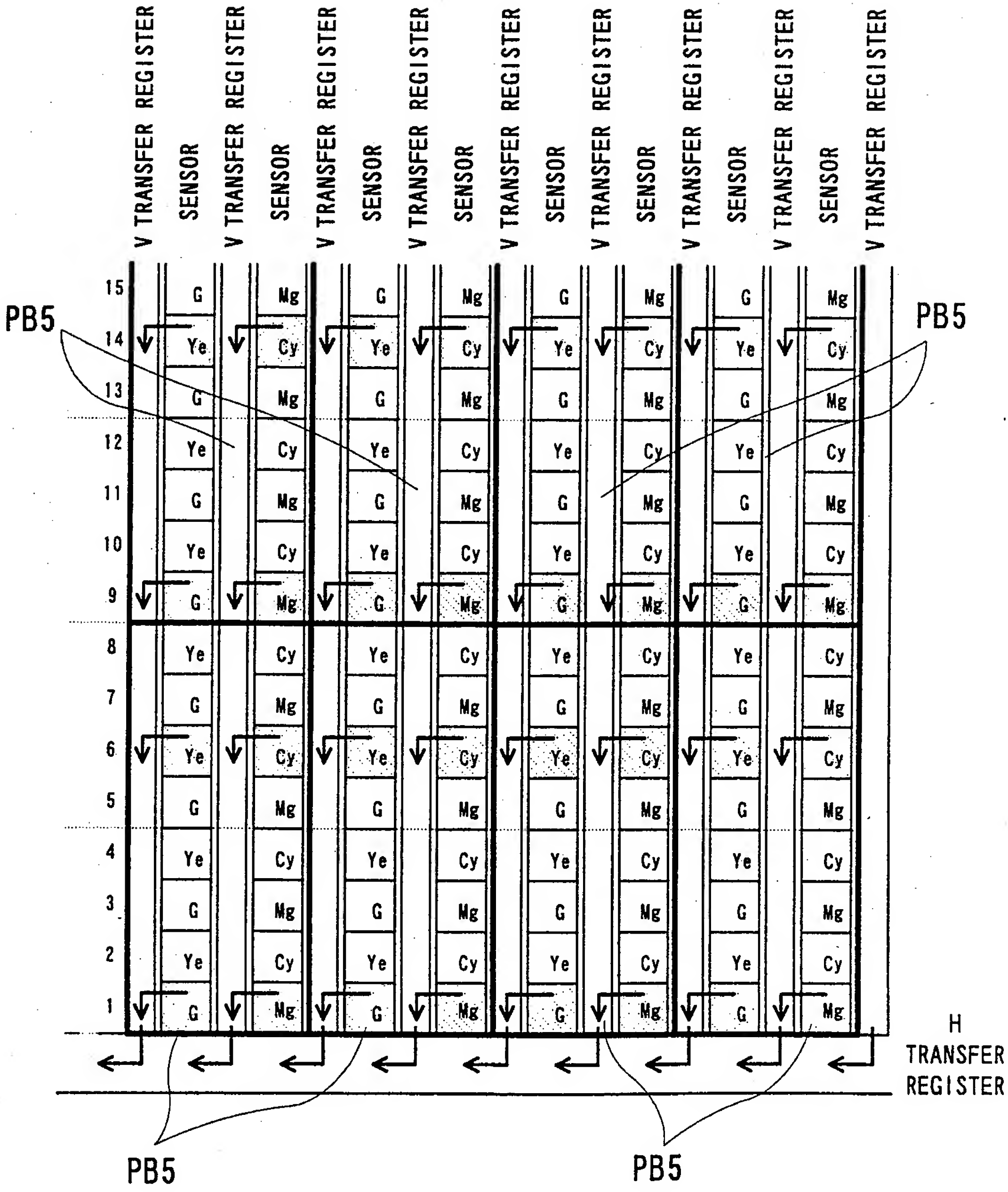
ROWS 1, 2

(C)



ROWS 3, 4

FIG. 32


V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
SENSOR
V TRANSFER REGISTER
PB5
PB5
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
G
Mg
Ye
Cy
H TRANSFER REGISTER
PB5
PB5